

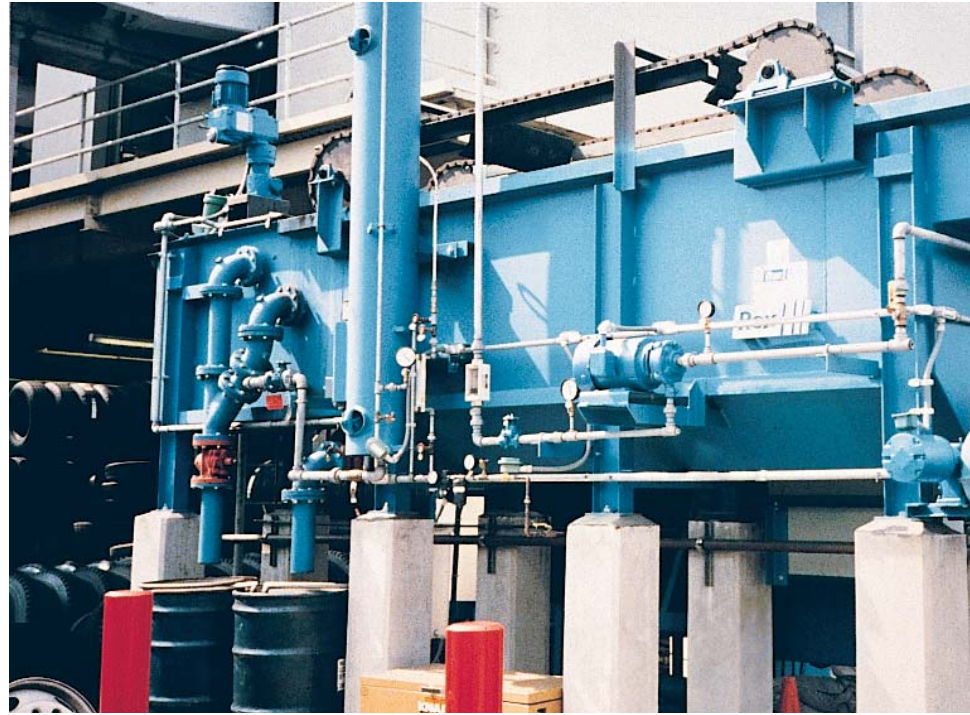


**SIEMENS**

Water Technologies

Float-Treat®  
For Effective  
Separation  
By Dissolved  
Air Flotation

*Float-Treat® tank with reaction jet feed assembly minimizes short-circuiting by evenly distributing influent flow across the entire width and depth of the separator.*



*The unique design features of the pressurization tank insure maximum air dissolution in half the time of other designs.*



### **RECIRCULATED EFFLUENT IS BLENDED WITH THE INFLUENT FLOW**

The Float-Treat® separator provides effective removal of suspended solids, fats, oils and greases from liquids by dissolved air flotation. Flotation of the solids is accomplished by the introduction of microscopic air bubbles into the process water. As these bubbles rise, they attach themselves to the particles in suspension and carry them to the surface for removal.

An important principle of the Float-Treat® system is the introduction of air (or other gas) into the recirculated effluent, and blending the recirculated flow with the influent flow. The recycled effluent is pumped to a pressurized air saturation tank where the maximum possible quantity of air (gas) is dissolved in the recycle stream.

The recycle stream is then blended with the influent flow prior to entering the flotation chamber. As the air (gas) saturated flow is restored to atmospheric pressure, microscopic bubbles are formed. When the recycle stream enters the tank, baffles assure thorough, rapid blending with the raw influent flow and dispersion throughout the cross section of the tank.

The Float-Treat® system features integral flash mix and flocculation chambers when chemical conditioning is required. The resulting floc rises more rapidly by increased affinity for air bubble attachment. This feature increases process capacity, resulting in a higher degree of treatment.



## Float-Treat® Separator A Proven Performer

*This Float-Treat® separator removes oil and solids from diesel washdown wastewater at one of the world's largest entertainment parks. The simple but efficient design combined with high quality workmanship insures minimal operator attention and lengthy uninterrupted operation.*

### EXPERIENCE:

The first Envirex® dissolved air flotation system was introduced to the marketplace in the 1950's.

During those early years, the company was a leader in the practical application of the process and made several important contributions to the technology. Among these were the use of a pressurized recycle stream in place of total wastewater pressurization; and a perforated pipe manifold diffuser and perforated distribution baffle to control the introduction of the recycle stream into the main flow. In effect, we developed how to dissolve the air and how to effectively release it.

Since then, we have continued to update the technology supporting the DAF process, including regulatory safety concerns, materials of construction and process capacity. A list of technical papers regarding these areas is available upon request.

### FIELD PERFORMANCE:

First introduced to the marketplace in 1951, hundreds of Float-Treat® separators are now working effectively in a wide range of industrial and municipal applications.

### DESIGN FLEXIBILITY:

Wide choice of equipment available to assure the proper design for each application. Float-Treat® systems can be used in either steel or concrete tanks . . . existing basins can frequently be converted to Float-Treat® units. Float-Treat® separators will effectively remove settled as well as floated material . . . standard equipment designs provide a combination of skimming and settled sludge removal.

### LOW PRESSURE DESIGN:

Typically, recycle stream operates at 40 psi (275.8 kN/m<sup>2</sup>) contributing to reduced pumping equipment, air saturation vessel and control cost.

### NO BREAK-UP OF DELICATE SOLIDS:

Raw influent liquids are not subjected to pumping action. Consequently, there is no emulsification of fats and oils or shearing of produced flocculated particles.

### CONCENTRATED FLOAT:

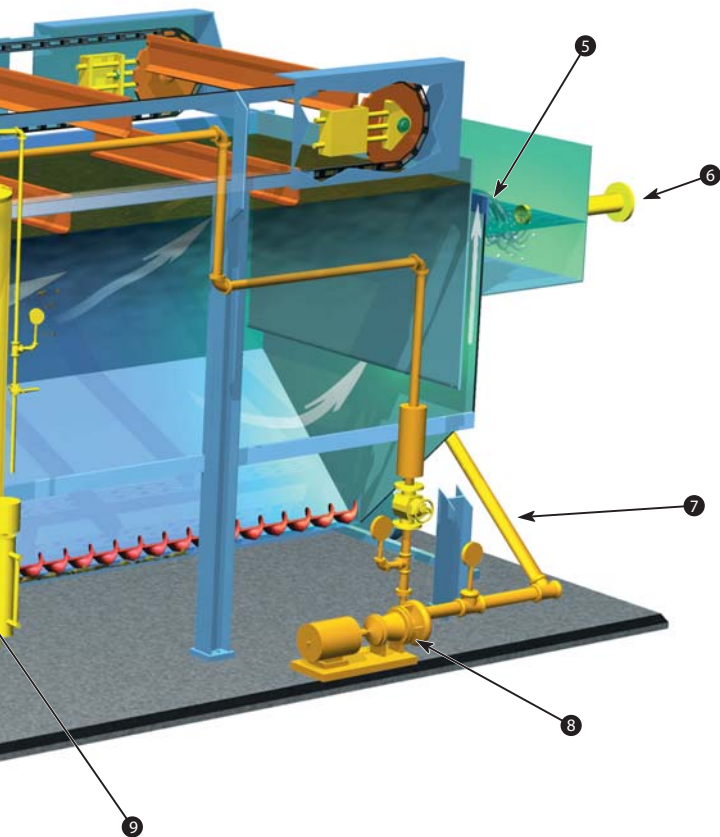
Float-Treat® separators provide float solids of 3-25%, even with low influent solids. Concentrated float reduces disposal costs compared to other flotation technologies.

### LOW MAINTENANCE:

Baffled air saturation tank eliminates fouling. Non-metallic components provide exceptionally long life in most applications. Other operating components are selected for long term performance.



# Features



## FEATURES FOR STEEL OR CONCRETE TANKS

### 1. FLASH MIX/FLOCCULATION.

When chemical conditioning is required, integral flash mixing/flocculation tanks provide optimum treatment. Transfer of the waste flow from one tank to the next is accomplished at low velocities by gravity, minimizing shear forces on the floc.

### 2. FLOAT DISCHARGE LINE.

### 3. FLOAT BEACH.

Designed to assure positive removal of concentrated solids.

### 4. SKIMMER.

Chain and flights are available in metallic or non-metallic materials. Materials are selected based on corrosive conditions, explosive atmospheres, etc.

### 5. ADJUSTABLE EFFLUENT WEIR.

Controls water level in tank for optimum skimming.

### 6. EFFLUENT LINE.

### 7. RECYCLED EFFLUENT.

Provides a continuous supply of treated effluent for recycle system even though raw flow may be interrupted.

### 8. RECYCLE PUMP.

Withdraws a portion of effluent and pumps it to air saturation tank.

### 9. AIR SATURATION TANK.

Designed and tested to conform to rigid code requirements. Positive liquid level control and baffles assure complete saturation of recycle flow.

### 10. AIR CONTROLS.

Air is fed to the pressure tank for optimum saturation.

### 11. PRESSURE REDUCTION VALVE.

Maintains desired upstream pressure in air saturation tank. Generates headloss required to reduce recycle flow stream to atmospheric pressure, forming microscopic air bubbles.

### 12. SETTLED SOLIDS REMOVAL AND BOTTOM SOLIDS DISCHARGE LINE.

Accomplished by any of several types of conveyors . . . from screw conveyors in smaller tanks up to heavy-duty chain and flight collectors for the larger tanks.

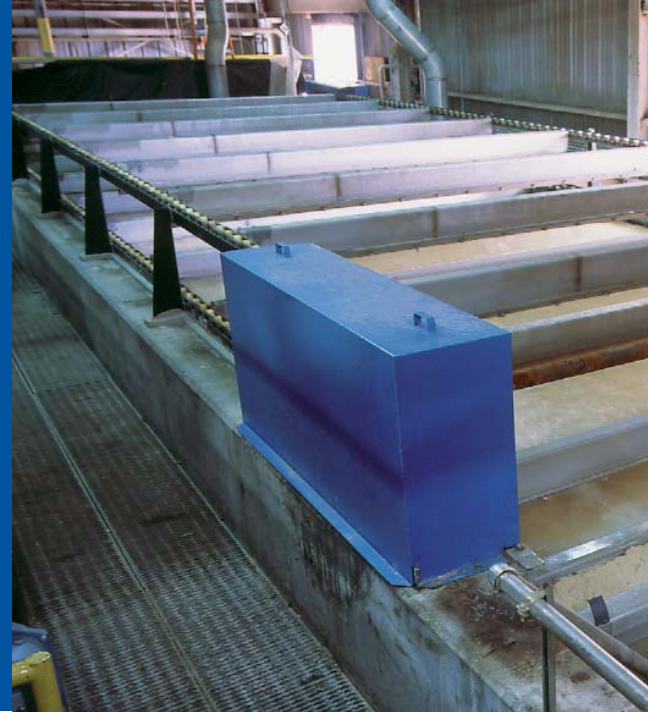
### 13. INFLUENT / RECYCLE BLENDING AND DISTRIBUTION SYSTEM.

Inlet arrangements are carefully sized and located for correct velocities, proper bubble formation and thorough blending.

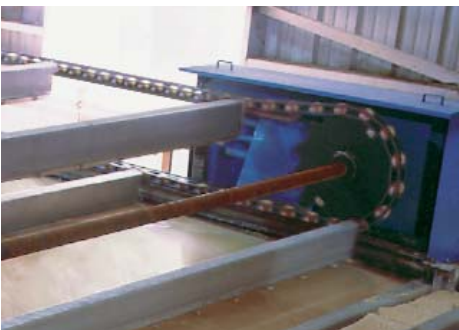
### 14. INFLUENT.

# Proven Components

*Float-Treat® separator at a paper mill pays testimony to the depth of our industry specific experience. With hundreds of separators installed in paper mills, petroleum refineries, steel mills, etc., Siemens has unequalled flotation experience.*



*Two skid-mounted factory prepiped and wired recirculation/pressurization systems reduce site installation costs.*



*This skimmer mechanism consists of stainless steel flights, high strength non-metallic loop chain and polymeric sprockets. The corrosion resistant components insure years of continuous operation.*

## AIR SATURATION SYSTEM:

A portion of the clarified effluent is saturated with air at 40 psi (275.8 kN/m<sup>2</sup>). The recycle flow is then combined with influent flow entering the flotation chamber. When the pressurized mixture enters the flotation chamber, microbubbles adhere to or are trapped in the particle structure. Increased bubble-particle buoyancy carries solids to the surface.

Recycle pressurization eliminates emulsification caused by a pumping action and turbulent conditions which occur during partial or total pressurization of influent water. Recycle pressurization assures a high quality effluent when handling a flocculated wastewater by minimizing shear. Additionally, with recycle pressurization, the system is unaffected by nominal influent and solids variations.

## STEEL TANK:

Shop fabricated steel tanks are available in 15 standard sizes to handle capacities from 30 to 3,000 gpm (6.8 to 681m<sup>3</sup>/hr). Tanks up to 80 feet (24 m) long can be shipped completely assembled with skimmers, integral flash mix and flocculation (if required), baffling, weirs, etc., or as modules.



## SURFACE SKIMMER:

Skimming flights pivot 360 degrees and are fiberglass reinforced for strength and to resist wear. Two strands of high strength loop chain running over exceptionally durable polymeric sprockets carry surface skimming flights.

## DRIVES

(skimmer, bottom conveyor, flocculator, flash mixer): All drives have safety enclosures, are rated for continuous operation and sized to start-up under worst-case conditions. Drives are mounted on the exterior of the tanks.

*Circular Float-Treat® separators can be the economical alternative in many applications, as at this petroleum refinery. Circular units are available as a standard package unit or as modular build units.*



## VOC/ODOR CONTAINMENT COVERS:

Fixed covers are composed of interlocking fiberglass panels with access hatches for maintenance. They are light, easily removable and highly serviceable. They will not become damaged over time due to expansion or contraction. They do not interfere with skimming operations. Virtually vapor tight, they comply with VOC control regulations.

## CIRCULAR FLOAT TREAT®

separators incorporate the same design principles as rectangular units. The internal mechanism is similar to a circular clarifier. The major difference is the skimmer assembly, which, due to the heavier load, is designed stronger. Flocculation and flash mixing, if required, are handled externally from the circular basin. Other options can be included such as chemical addition, steel tankage and installation.

## FOLDED-FLOW® DAF/DGF SEPARATORS:

The Folded Flow® DAF/DGF separator is an innovative device recently introduced to the market. Per unit area, Folded Flow® separators treat 2-5 times normal DAF separator capacity. This makes the system attractive in terms of cost and area requirement compared to other systems.

*Leaktight fiberglass covers for VOC containment are being installed on a Float-Treat® separator at a petroleum refinery. These lightweight, easy to install covers are designed for airtight operation under positive pressures to insure safe operation even in explosive environments.*





*Float-Treat® Separator pilot units are available for test purposes. This test unit is easily connected to existing plant lines and will quickly demonstrate the suitability of Float-Treat® and help establish design criteria for the full scale plant.*

In industrial waste treatment, Float-Treat® separators can be used to recover raw materials from process water. Materials such as fibers, light chemical flocs, organic wastes, light and delicate solids, fats, greases and oils are easily recovered.

In other applications, Float-Treat® units can often provide a more efficient treatment alternative when used as a final clarifier.

The Float-Treat® separators alone may not be a complete answer in many applications. In these applications, Float-Treat® equipment forms an efficient, integral part of a complete system.

Float-Treat® separators have proven effective in applications in:

- Oil Production and Refineries
- Pulp and Paper Mills
- Meat Packing
- Gelatin Plants
- Soap Manufacturers
- Chemical Plants
- Building Material Plants
- Metal Working/Steel Plants
- Automotive/Truck Plants
- Railroad Yards
- Glass Plants
- Food Processors
- Pharmaceutical Plants
- Steel Mills
- Poultry Processing
- Dairy Industry
- Algae Removal

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