

# Dissolved Air Flotation

compact seria with airlift principle [Qd= 300 m<sup>3</sup> /day]



## Description

The plant is fully automated. By a non-clogging special cavity pump the flotation reactor is feed by the water from client`s balancing tanks or PPU buffer tanks. Pre-aerated buffers are advised.

The wastewater passes through a pH-controlled inline tube system where the pH is adjusted if necessary. Then it enters continuously tangential into the reactor .In a polymer-mixing station stuff is created that supports the flocculation and flotation process. These are automatically added by the inflowing sewage flocculators. About a multiphase pump the flow of water is continuously saturated with air, then returned via a recirculation in the reactor. The pressure release causes an uplift of the flotation material by fine air bubbles. These are collecting and concentrating in the upper area of the reactor and will be separated by a scraper or discharged through a cone-shaped hole by compressed air. The clean water is drawn off in the middle and can be discharged, also sludge leaves by gravity.

## Operation

Depending on the inflowing water constantly a good efficiency rate to all time is achieved. In addition to low daily inspection work, the operator must ensure the consumables and the further disposal of the flotation sludge. The plant should be daily checked for the wastewater composition, chemical agents, and the adjusted amounts of air pressure. We use no clearing device with movable chains (lubricant use, etc.). The units are robust, and particularly in the food industry for years in use. The daily time effort for controlling this simple compact units is approximately 0.25 hours by instructed staff from client.

## Cleaning efficiency

The process removes solids, fat, oil and some biodegradable materials, pH is adjusted at 7 ,temperature is not changed, the effluent quality is suitable for a following fully biological cleaning. (typical parameters to be achieved food/oil industry in the INLET / OUTLET example are [mg / l] COD IN :3000-7000 / OUT :1000-1500, IN BOD: 2000-3500 / OUT :700-1000, IN TSS: 500-1500 / OUT :5-50

## Installation rack mounted, sea containers

The system is mounted

- a) by means of reducing efforts on **support frames/racks** (client`s service is all electrical and tubework)
- b) or totally preinstalled in ISO container, which are used as transport housings for seatriansport. (plug&play)

It consists of mainly 4 parts :

**P** = feeding station with saturation and mixing line,

**F** = flotation reactor including recycle stream and peripheral pump, sludge,

**D** = dosing pumps, polymerstation with mixer, chemical agents (2x) suction lines, pH sensors and finally control cabinet (**CPU**).

The 3 racks and the cabinet can be free positioned. The bases for the units must be firm and level (foundations); environment dewpoint protection, dry, covered; in a maximum distance from the storage tank / control unit of 10 m, indoor installations require air changes in accordance with local regulations.

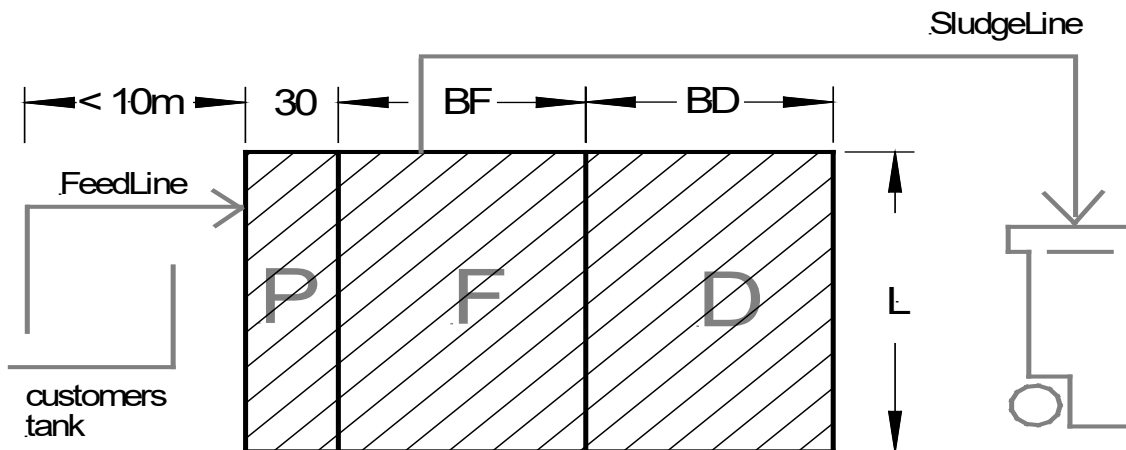
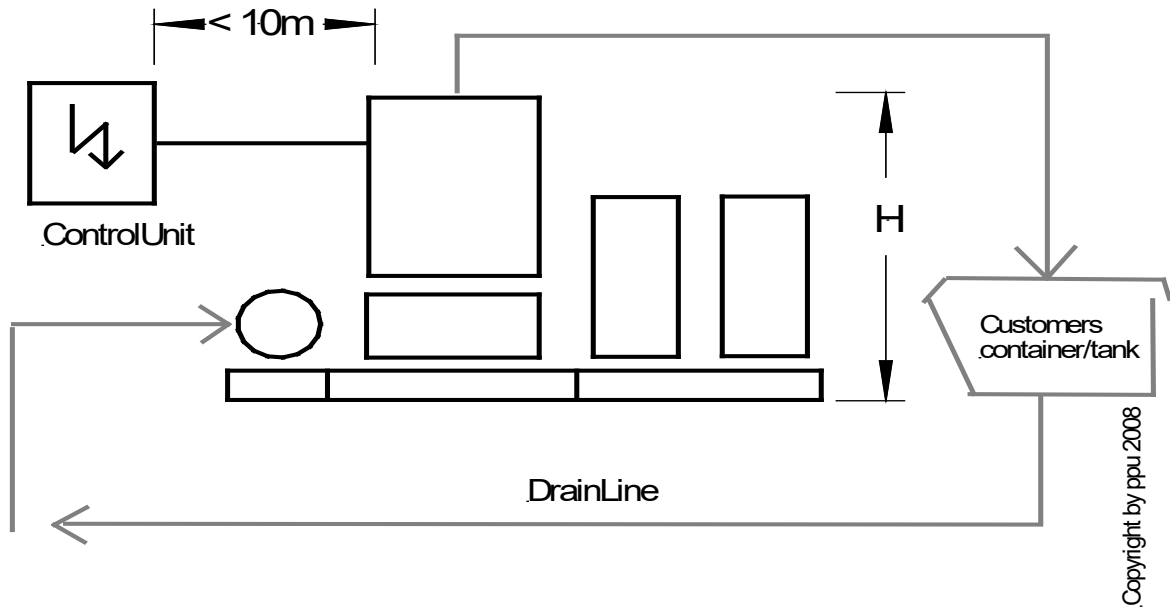
It makes sense to avoid closed enclosures to odors, and an arrangement together.

The containerized system is totally plug &play including air compressor and a ventilation system for the odour exchange, the rack mounted must be positioned, connected, compressor and ventilation by client

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## PPU-Flotation



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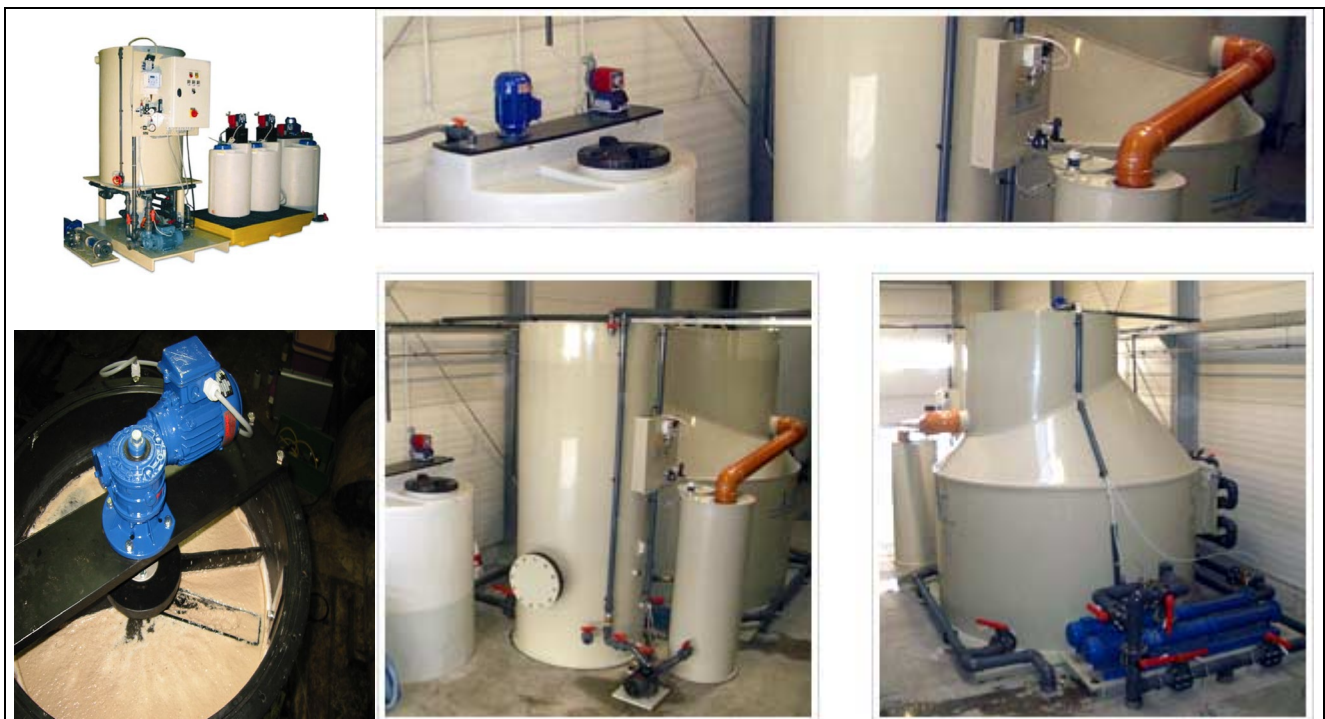
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## Residues

In the flotation fats and oils are removed from the wastewater. It is thereby also continuously called flotation sludge. The resulting amount depends on the concentration of oil/solids and the precipitated/flocculated wastewater. The flotation sludge for reuse or disposal must be collected in a container. For smaller flotation sludge suitable for this purpose waste container or dump bodies, depending on the disposal system. These must be dewater the water is returned to the hopper. Bigger systems require sludge thickener and press devices. At average concentrations per m<sup>3</sup> of wastewater can be expected from about 40 to 60 liters of flotation sludge thickened. This corresponds to an amount of about 4 to 6 percent by volume in relation to the daily feed waste water out of production.

## Reference / pictures



(top left: Flotation system, top right: Dosing, down left: Flotation sludge, down middle: Reactor)

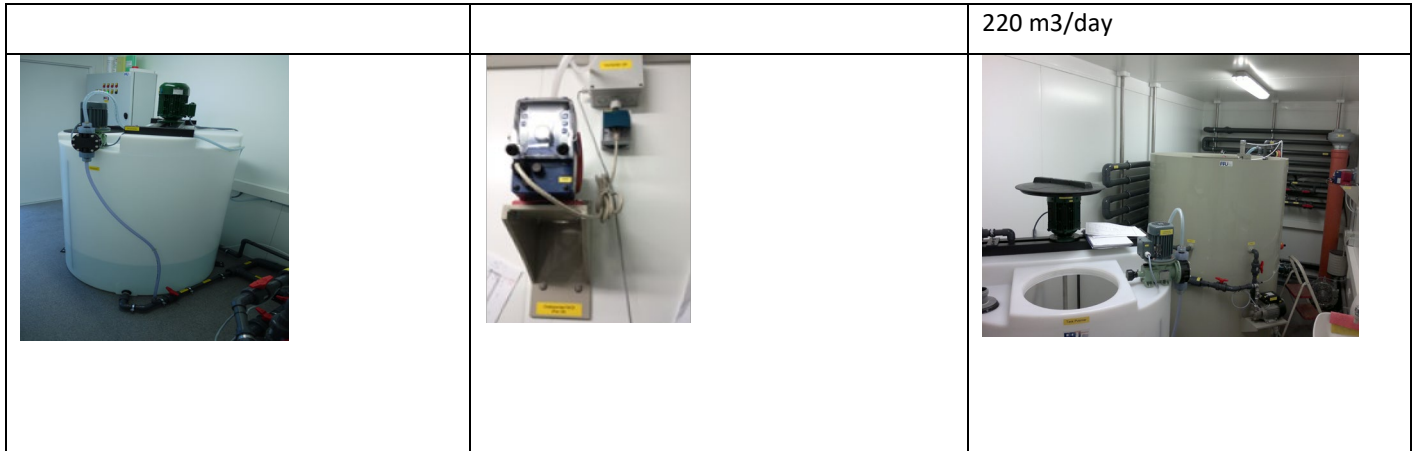
The plant series is characterized initially by an extremely robust, space-saving design. The great success of the system technology is based, but in a simple and cost effective operation. It is in many major European food producers, as well as in Eastern Europe in action.



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## Technical data

Daily wastewater out of production [m <sup>3</sup> /d]	- 20	- 40	- 60	- 100	- 150	- 200	- 300
Size of buffer on site in m <sup>3</sup> (ca.60% m <sup>3</sup> /d) advised	15	29	43	72	108	144	180
Max. flowrate of DAF [m <sup>3</sup> /h]	1,0	1,0– 2,0	2,0– 3,0	3,0– 5,0	- 7,5	- 10,0	- 15,0
Power consumption Flotation electrical, 50Hz [KW]/ Ampere 400 Volt	3/20	5/20	5/20	5/20	7/25	10/25	12/25
Sludge discharge with	manually	Compressed air, semi-automatic	Compressed air, semi-automatic	Compressed air, semi-automatic	Compressed air, semi-automatic	Compressed air, semi-automatic	Compressed air, semi-automatic
Sludge storage/-treatment on site advised as:	Waste Container	Sludge Container	Sludge Container	Sludge Container	Sludge Container	Sludge Container	Sludge Container
BF [cm]	85	100	125	150	175	200	220
BD [cm]	85	85	85	85	100	150	175
L [cm]	125	125	150	200	200	210	210
H [cm]	190	210	210	210	220	220	220

## Delivery time

winter :6-8 weeks, , summer: 8-10 weeks after receipt of order.

The license code for fully automatic operation is transmitted to the functional testing, commissioning and operation of the agreed test period. This condition is valid until the system is completely balanced.

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## clients service

### containerized version:

install feed suction line in buffer, connect sludge outlet pipe to sludge treatment, connect clearwater outlet, power connection, PPU support line, documentation available for startup, operation and maintenance

### racked version:

only skilled companies, all connections onsite, PPU supervisors to be onsite is advised, installation guide as documentation is not available, no guarantee for clients services

## Technical equipment /scope of delivery

The Clearfox DAF system installed in sea container or skid mounted is designed for plug&play, The Clearfox DAF system installed on racks can easily be made for operation, by connecting the devices. The technical equipment is complete for a simple installation onsite and also the installation and mounting materials are included. The main part list includes the following technical devices:

	Patented DAF reactor in Polyethylene, no moving parts, sludge discharge by airlift
	Feed pump, eccentric screw pump, design flowrate @ 1 bar pressure
	Dry run protection device with display, temperature control
	Soaking lance DN xx
	CPU- Control unit, display, software installed for fully automatic operation, premounted with all technical devices, motor switches for every device, plugs for installation, finger protection, VDE conform, free adjustable parameters, picture- bases owners manual 40 pages english
	Control cabinet powder coated
	High quality recycling pump for multiphase operation
	Pressure sensor for recycling stream
	Pressure hold valve, non sticking cking version
	Hydraulic sludge lifting system, without rotational parts
	Storage tank for precipitation liquid
	Sensor maintenance free for storage of precipitation liquid
	Dosing pump precipitation, including regulation program, various adjustments
	Storage tank for NaOH liquid
	Sensor maintenance free for storage of precipitation NaOH liquid
	Dosing pump NaOH, including regulation program, various adjustments
	Mixing and Storage tank for polymer liquid, including a stirring/mixing device drive, hand switch for manual
	Sensor maintenance free for storage of polymer liquid
	Dosing pump polymer, including regulation program, various adjustments
	Air saturation pipeline PVC, deaeration devices
	Mixing device pipeline PVC, sensor attachments including pH sond
	<i>Container version all devices connected</i>
	<i>Racked version all devices premounted in 4 component groups (on racks P,F,D + control cabinet)</i>