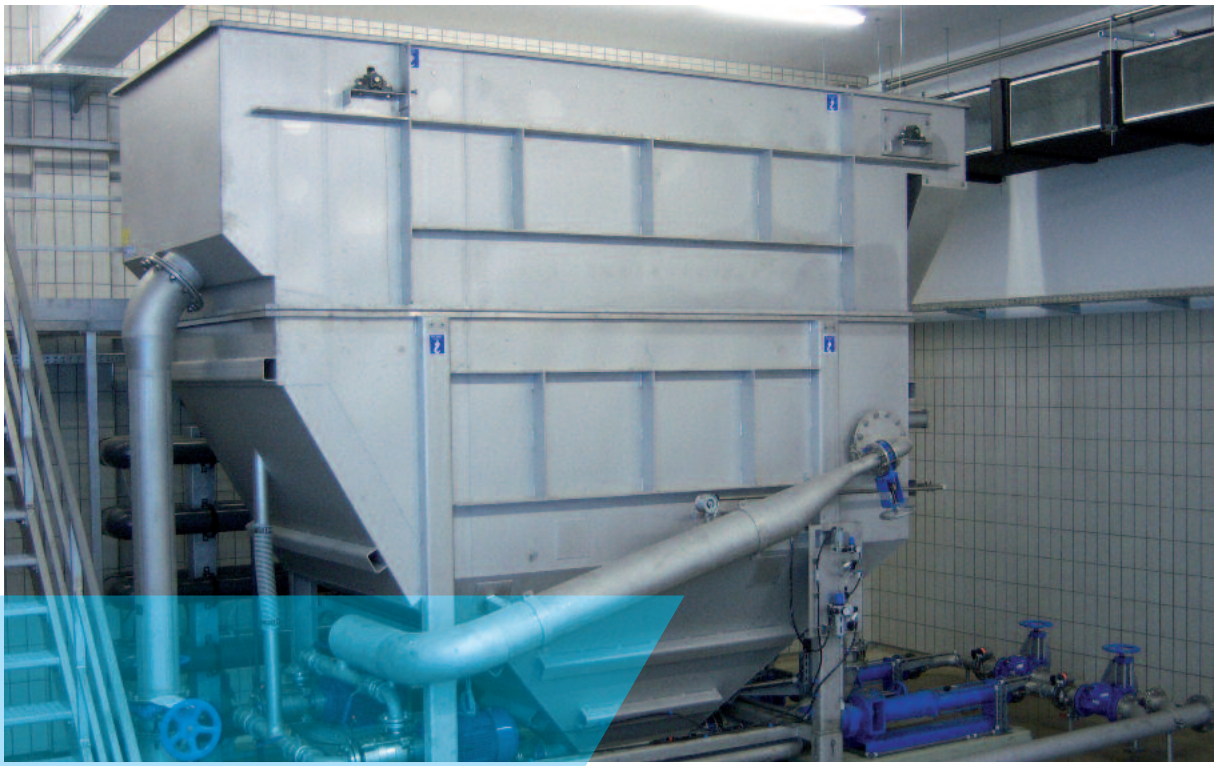
HUBER TECHNOLOGY
WASTE WATER Solutions

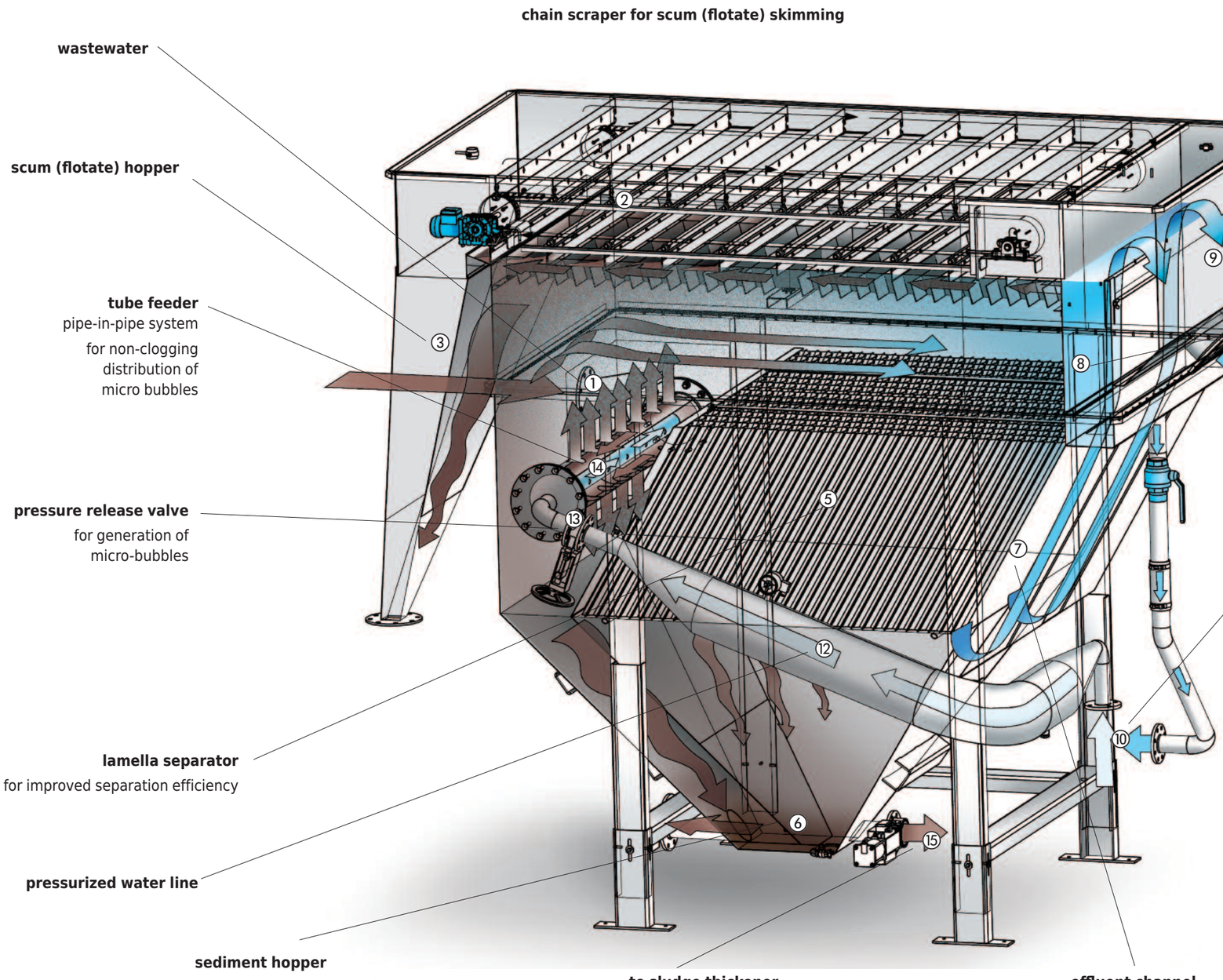
HUBER
Dissolved Air Flotation Plant HDF



Efficient and dependable solution for:

– Wastewater treatment
– Valuable material recovery
– Water recycling

HUBER Dissolved Air Flotation HDF for advanced (waste)water treatment with micro bubbles



Features

The (waste) water to be treated enters the flotation plant via the tube feeder ①. The air-saturated water is released. The micro bubbles (20 – 40 µm dia.) generated when the pressure is suddenly released are intensively mixed with the suspended material in a tube feeder (special pipe-in-pipe system) ⑭.

The gas bubbles attach to the surface of solids. Due to their increased buoyancy, the light aggregates of solids and air bubbles float to the water surface.
The blended influent flows upward into the tank of the dissolved air flotation unit where it is evenly distributed over the total tank width. The laminar flow conditions ensure optimum phase separation.

The solids/gas flocs rise to the water surface where they form a scum (or flotate) layer that is skimmed off into the flotate hopper ③ by a scraper ②. The scraper joists with their special design dewater the flotate additionally. The flotate is either collected in a container or by an eccentric screw pump delivered to further treatment stages (e.g. sludge dewatering with ROTAMAT® Screw Press RoS 3) ⑮.

The non-clogging lamella separator ⑤ increases the effective clarifier area, for maximum hydraulic loads on a small footprint. While the water flows down through the gaps between the inclined lamella plates, buoying flocs rise a short distance and attach at the lower surface of the upper lamella and dense particles sink a short distance to the upper surface of the lower lamella. The lamellae retain thin layers until they are grown into thick and compact layers that finally detach from the surface and slide quickly up or down along the lamella surface. Detached light aggregates slide up and rise to the water surface where they form a floating scum layer. Heavy sludge aggregates slide and sink down to the bottom of the tank into the sediment hopper ⑥ from where they are either removed by an eccentric screw pump or gravity discharged by means of a pneumatically controlled valve. The clarified water, after it has passed down through the lamella separator, rises up again through a channel ⑦ to an effluent box ⑧. The water level in the tank and the immersion depth of the scraper is adjusted by the position of an effluent weir ⑨.

Up to 30 % of the effluent is recirculated for the generation of pressure water. A multi-stage centrifugal pump ⑩ generates a pressure of about 6 bar. A compressor ⑪ feeds compressed air (> 12 %) to the pump rotor that generates small bubbles with a large surface for quick water saturation. Saturation of the water with air is completed in a tubular reactor ⑫.

The saturated water flows through a single pressure release valve ⑬, where the micro bubbles with a diameter of 20 to 40 microns are generated when the pressure of air-saturated water is suddenly released. In the tube feeder ⑭ the micro bubbles thoroughly blend with the influent to be treated so that all solids get in close contact with a sufficient number of micro bubbles.

Grease, oil, floating and suspended matter, settling solids, dissolved pollutants

A problem in process and wastewater

Water is a vital commodity which demands economical use.

Process water is needed in many production processes as a solvent, for production of material, or for cleaning purposes. Water is recirculated and reused for economical and environmental reasons. Grease, oil, fat, floating and suspended solids, settling material, and dissolved components need to be separated to provide good and uniform water quality. Recovery of valuable product from the water may be another additional objective.
In addition, clogging and excessive wear of pipelines and other associated equipment is prevented, which increases the operating reliability of the production plant.

Where used process water is discharged as wastewater, pre-treatment is often required to prevent toxic or otherwise harmful substances (e.g. heavy metals, HC, AOX, etc.) from entering the sewer system and reduce thus surcharges and fees.

Conventional gravity clarifiers are often incapable to achieve sufficient pre-treatment.

Various types of flotation processes have been developed, whereof dissolved air flotation with pressure water recirculation has proven most effective.

The HUBER Dissolved Air Flotation Plant provides a significantly improved flotation process with a special inlet structure that provides optimum control of the flow within the flotation tank.

Virtually laminar flow conditions in the actual separation area decisively enhance phase separation. The multistage rotary pump for recycle water saturation with air eliminates the need for costly pressure tanks with high maintenance requirements. The integral lamella separator increases the effective separation area and allows therefore a small and low cost design.

HUBER Dissolved Air Flotation Plants are used for a wide variety of industrial and municipal applications, such as:

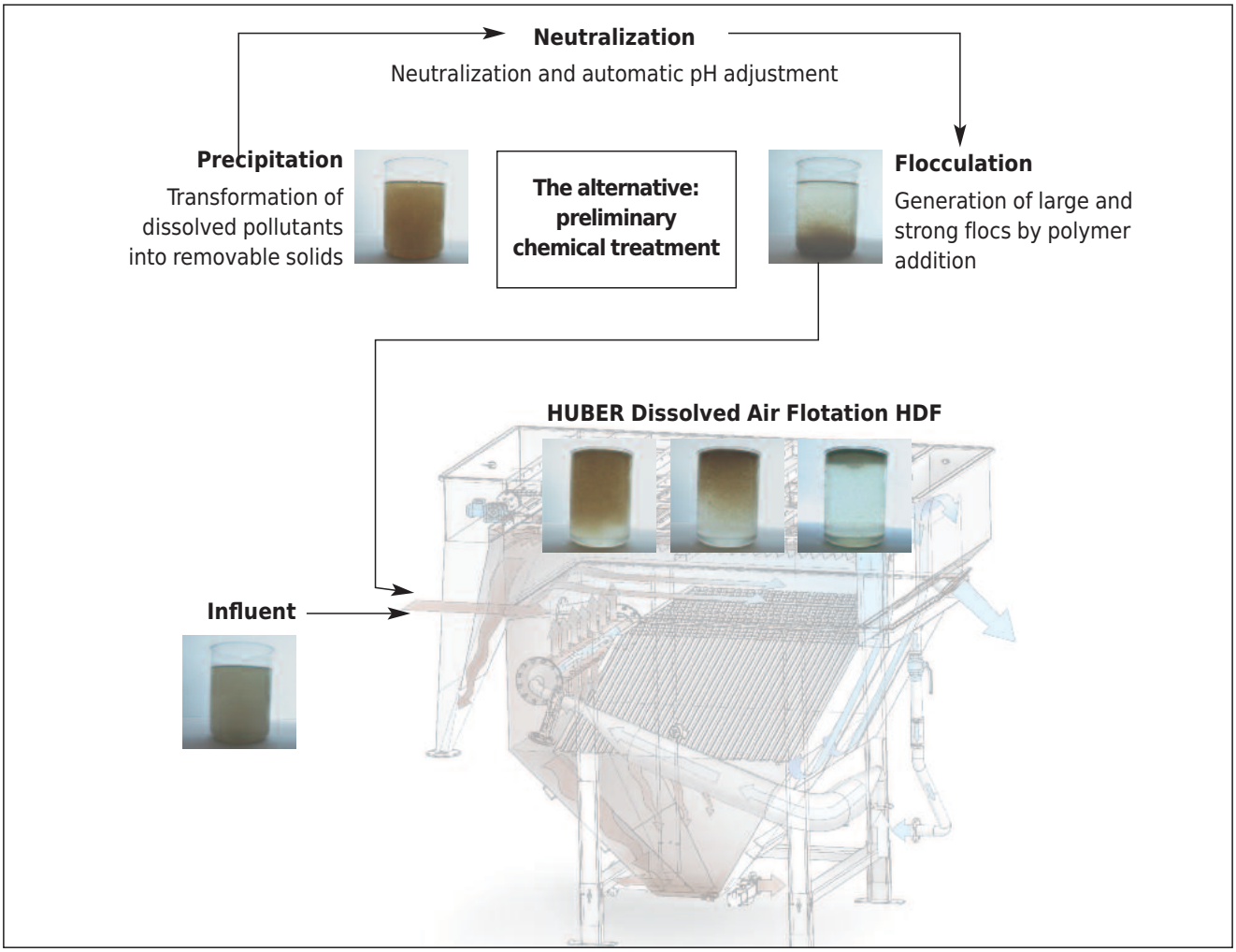
- Slaughterhouses
- Meat processing and packing
- Fish processing
- Dairies
- Convenience food production
- Margarine production
- Oil and fat refineries
- Canneries
- Industrial kitchens and canteens
- Fast food providers
- Soap works
- Cosmetics industry
- Textile industry
- Chemical industry
- Petrochemical industry
- Iron and steel industry
- Metal processing
- Galvanizing, electroplating
- Land remediation
- Waste management
- Municipal wastewater treatment

System approach

We provide complete systems for mechanical-physical water treatment by combining the HUBER HDF with other HUBER components

- Chemical pre-treatment by precipitation, neutralization and flocculation in a tube reactor to improve separation efficiencies, and even remove some dissolved pollutants
- Mechanical pre-treatment with ROTAMAT® Micro Strainer Ro 9, or ROTAMAT® Rotary Drum Fine Screen Ro 2, or ROTAMAT® Complete Plant Ro 5
- Treatment of the removed scum and sediment: Sludge thickening with ROTAMAT® Rotary Screw Thickener RoS 2; sludge dewatering with ROTAMAT® Screw Press RoS 3
- Complete wastewater treatment: Additional biological treatment with HUBER VRM® membranes (→ direct discharge). Tertiary filtration with HUBER CONTIFLOW® CFSF

Improved separation efficiency through chemical pre-treatment



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