Effective and efficient wastewater and process water treatment for industrial applications through flotation with micro bubbles

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 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.

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

- Slaughterhouses
- Meat processing and packing
- Cosmetics industry
- Textile industry
Chemicals dosing is optimal if the flotation system constantly achieves the required performance without overdosing of chemicals and unnecessarily increasing operating costs. In practice, it proves to be difficult to adjust the chemicals dose due to varying volumes and freights.

Large-dimensioned mixing and balancing tanks are beneficial but can frequently not be installed due to lack of space. Besides, the investments costs are high for the tanks and the accessory equipment required, such as circulation pumps and aeration systems for homogenisation.

The innovative HUBER Chemicals Dosing DIGIT-DOSE allows optimal dosing of the chemicals even with small mixing and balancing tanks. The specially developed system uses a combination of several measuring principles and constantly determines the optimal chemicals dose in real time.

Chemicals consumption, and therefore also operating costs, are reduced to a minimum. Additional positive effects can be seen in the volume of flotate sludge generated.

The production of hydroxide sludge resulting from overdosing of precipitants is effectively avoided. The further utilisation and disposal of the flotate sludge generated is a main cost factor of flotation plants. Furthermore, DIGIT-DOSE makes life easier for the operating staff as the system adjusts automatically to varying wastewater parameters without the need for any manual intervention.
Benefits

Advantages of the HUBER Dissolved Air Flotation Plant

- Completely made of stainless steel (1.4571)
- With optional chemical treatment stage - increased separation efficiency
- Standardized sizes for different applications
- Compact design, small footprint
- Simple pressure release principle by means of a single valve for maximum operating reliability
- Efficient, gentle mixing of the air bubbles into the wastewater flow
- Defined tank flow due to the optimal design of the blending and feeder construction in the flotation tank
- Large effective clarifier area due to the lamella separator, minimized risk of blocking due to suitably dimensioned gaps between the lamella plates
- Generation of saturated pressure water with a multi-stage pump which is not subject to the pressure tank regulation
- Experience from hundreds of installations in a variety of fields of application

Additional benefits of the DIGIT-DOSE system

- Up to 30% reduction in chemicals consumption
- Stable effluent values even for varying volumes and freights
- Support and relief for operating staff
- Up to 20% reduced disposal costs for flotate sludge
- Integrated automatic cleaning of the measuring equipment used without additional fresh or warm water
- Low investments costs and space requirements for mixing and balancing tanks
- Return on investment within few months, proven with existing plants in operation

Details

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 and
  - Sludge dewatering with ROTAMAT® Screw Press RoS 3

- Complete wastewater treatment:
  - Additional biological treatment with HUBER VRM® Membrane Bioreactor (-> direct discharge).
  - Tertiary filtration with HUBER CONTIFLOW® CFSF

Case Studies

- Wastewater Treatment in the Dairy Industry – Development of customized solutions for direct and indirect discharge
- Intelligent chemicals dosing reduces operating costs for flotation plants
- Flotation for biomass separation replacing secondary settling tanks and secondary treatment systems
- HUBER flotation plant and screw press are a great help with the apple harvest in Serbia
• Fresh water savings in breweries: HUBER SE develops innovative process chain with Bavarian project partners
• Successful HUBER overall concept for beverage industry in Croatia
• HUBER wastewater treatment technology for the biggest factory of the milk processing company Berglandmilch in Austria
• MDF fibreboard production: HUBER pre-treatment systems for optimised operation of Kronospan’s wastewater treatment plant
• Membrane technology for wastewater recycling in textile industry
• New plant in Switzerland for innovative sewer grit treatment with process water recycling
• New machine to dewater fermentation residues in dry fermentation
• HUBER products for Europe’s biggest slaughterhouse
• A complete wastewater treatment concept for a meat processing company
• HUBER Supplies Complete Wastewater Treatment Equipment for Meat Processor KUPFER
• Wastewater Pre-Treatment Solution for a Slaughterhouse in Norway
• Wastewater pre-treatment at meat processing plant in USA
• HUBER Solutions for Food Processing and Paper Mills
• State-of-the-art HUBER Wastewater solution for Europe’s largest slaughterhouse

Downloads

- Brochure: HUBER Dissolved Air Flotation Plant HDF  [pdf, 1.69 MB]

Graphic Rendering
Animation: HUBER Dissolved Air Flotation Plant HDF
https://www.youtube.com/watch?v=exZb8jk7lls

Chemical-physical waste water treatment
https://www.youtube.com/watch?v=LtqL1lij0M

Video: Dissolved Air Flotation for wastewater treatment in a dairy
https://www.youtube.com/watch?v=HkqDkDsi070

Video: Video: HUBER Dissolved Air Flotation HDF in meat processing industry
https://www.youtube.com/watch?v=HvwV0BaLd68

Video: HUBER Dissolved Air Flotation Plant HDF in a grit treatment process
https://www.youtube.com/watch?v=nNstEvZA-24

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