

HUBER products for Europe's biggest slaughterhouse

Europe's biggest pig slaughterhouse Danish Crown, Horsens decided to build the probably most modern slaughterhouse in Europe. In addition to the best state-of-the-art production and slaughtering equipment the management decided to invest also in the field of wastewater and sludge treatment and install most advanced and high quality technology, a complete mechanical and physical-chemical wastewater treatment plant supplied by HUBER SE.

The basic principle is not to combine the wastewater flows of different origin! The wastewater is therefore divided into three individual flows:

- ▶ Flow No. 1 is produced in the packing and freezing division (maximum flow: 35 l/s)
- ▶ Flow No. 2 is produced in the slaughtering and cutting division (maximum flow: 94 l/s)
- ▶ Flow No. 3 comes from the truck washing stand (maximum flow: 15 l/s)

Each of these flows is separately pre-clarified with a specific mechanical screen. Each screen design is adapted to specifically meet the requirements of the individual wastewater flow.

- ▶ Flow No.1 is treated with a ROTAMAT® Rotary Drum Fine Screen Ro2, size 780, with 1 mm bar spacing. The screen's main job is to remove packing material residues that consist of paper and pieces of wood.
- ▶ Flow no. 2 is more problematic. Slaughterhouse wastewater contains a lot of grease. Solids, such as bristles, pieces of meat or even meat hooks may pass or fall into the machines. The screens to be installed therefore had to be very sturdy and offer a reliable screen surface cleaning system. That is why the ROTAMAT® Rotary Drum Fine Screen Ro2, size 1000, 1 mm bar spacing, with optional hot water cleaning was selected. A main request from the customer was to eliminate the need to disturb or even interrupt the slaughtering processes when maintenance work has to be carried out on the wastewater treatment plant. That is why three screens were installed, so that the main load can safely be handled with two screens and the third screen used as a stand-by unit if and before one screen is shut down.



Flotate sludge dewatering with two ROTAMAT® Screw Press RoS 3/3 units with pipe reactor during installation

- ▶ The flow No. 3 is dewatered by means of 2 ROTAMAT® Micro Strainers Ro9, size 700, with 3 mm perforated plate. High solids concentrations and at the same time a low flow are characteristic for this wastewater flow. Sawdust and hay are typical materials contained, which the Micro Strainer must be able to handle. In this project, a ROTAMAT® Rotary Drum Fine Screen Ro2, size 2,780, with 1 mm bar spacing is installed after each of the Micro Strainers. This additional treatment step is required as also the wastewater from the truck washing stand flows into the mixing and regulation tank and thus into the flotation plant.

All wastewater flows flow into a mixing and regulation tank (with approx. 800 m³ capacity) directly after having been screened and without any further treatment. The large storage capacity ensures a regular flow even in the event of hydraulic and load peaks.

In the last step of the wastewater treatment process the pre-clarified and homogenised wastewater is pumped into three HUBER Dissolved Air Flotation Plants type HDF-7 with a hydraulic capacity of 80 m³/h each. (Q_{total} = 240 m³/h) To increase the plant efficiency, FeCl₃ and polymers are added to the wastewater. Emulsified grease, blood and very fine suspended material are then precipitated

and flocculated and can be separated by flotation. The chemicals are dosed in at several points in a pipe flocculator with DN 150 diameter.

The flocculator is so designed and dimensioned as to ensure reliable addition of the chemicals and a residence time that is long enough to form stable flocks.

The flotation plants are dimensioned to ensure that two units are able to handle the daily load. But a third redundant flotation unit was installed to again guarantee the high operational reliability and plant availability. In terms of maintenance the slaughterhouse production is thus completely decoupled from the wastewater treatment process.

A big question of the Danish Crown responsables was the treatment of the produced flotata sludge. But HUBER could provide a technically well-proven solution also for this purpose: flotata sludge dewatering by means of a ROTAMAT® Screw Press RoS3.

The maintenance requirements are low, which has a positive effect on operating costs. Compared to belt filter presses the screw press also reduces the cleaning requi-

rements as there are no filter belts, which might become blocked due to the high amount of grease. This again minimises operating and maintenance costs.

In summer 2005 both the slaughterhouse and wastewater treatment line were put into operation. The results are self-explanatory. The required effluent quality (COD, BOD, SS, grease, etc.) was achieved right from the beginning.

The excellent technology supplied combined with the perfect project processing with our local partners Krueger Denmark convinced the customer. He placed another order for a flotation plant, which were installed in a big Danish Crown plant in Blans in January 2007. Start-up of this HUBER Dissolved Air Flotation plant, with chemical treatment stage and for 120 m³/h throughput, took place in October of the same year. Due to our high quality equipment we once again convinced the customer and raise our good reputation.

Alexander Ghazinuri
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HUBER Dissolved Air Flotation Plant HDF 7 with chemical treatment stage and sludge tank