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## State-of-the-art HUBER Wastewater solution for Europe's largest slaughterhouse

In Europe's largest and best equipped slaughterhouse in Horsens, Denmark, built and operated by the Danish Crown Company, you can find not only the latest technology for slaughtering and meat processing, but also a HUBER state-of-the-art wastewater solution with



*ROTAMAT® flotat sludge dewatering RoS3/3 with flocculation reactor*



Three HUBER dissolved air flotation units HDF-7 with tubular reactors for chemical pre-treatment and sludge storage tank

mechanical and chemical process steps.

Three types of wastewater are collected and pre-treated separately:

- Flow 1 with a maximum of 35 l/s comes from the packaging and freezing department. It is screened with a ROTAMAT® Ro 2 with a wedge wire spacing of 1 mm and a screen basket diameter of 780 mm. The main task is removal of paper from wrappings and wood chips from pallets.
- Flow 2 with a peak of 94 l/s arrives from the slaughterhouse and butchery. This flow is more difficult because it contains fat and grease, meat pieces and bristles. Even butcher hooks can be found therein. A robust and well cleansable screen was needed. We selected ROTAMAT® Ro 2 screens with a wedge wire spacing of 1 mm, with an additional hot water spray bar for optional hot backwashing and a screen basket diameter of 1,000 mm. To provide for redundancy during maintenance work, three (2+1) screens were installed.
- Flow 3 with a maximum of 15 l/s is collected at the washing station for the livestock trucks. This flow contains high solids loads, mainly consisting of hay and saw dust. A pair of ROTAMAT® Ro 9 screw screens with 3 mm perforation and a screen basket diameter of 700 mm were selected. Downstream of each Ro 9 unit a ROTAMAT® Ro 2 screen with a wedge wire spacing of 1 mm and a basket diameter of 780 mm is installed. This tapered screening was chosen to combine removal of a high solids load by the Ro 9 with the excellent capture rate of the Ro 2.

After passage of the screens, all three wastewater flows enter a common balancing and storage tank with a volume of 800 m<sup>3</sup>. This tank serves for reducing hydraulic and freight peaks. The combined and equalized wastewater is then pumped to three dissolved air flotation (DAF) units HUBER HDF-7. Each of the three units has a capacity of 80 m<sup>3</sup>/h. Two of the units are sufficient to process the entire flow, the third unit serves for redundancy.

Before the wastewater enters a DAF unit, FeCl<sub>3</sub> is added as coagulant and polymer as flocculant. Emulgated fats, blood and colloidal particles are destabilized and flocculated, and can thus be removed in the DAF units. The chemicals are added at various points along the length of a tubular reactor with a nominal diameter DN 150. This tubular reactor is designed and dimensioned such that the chemicals are quickly mixed into a turbulent flow and that sufficient retention time for good flocculation is guaranteed.

An important requirement by our client was treatment and disposal of the generated flotat sludge. We supplied ROTAMAT® screw presses RoS 3 for sludge dewatering. Main advantages of our screw presses are that they are entirely enclosed and easy to operate and maintain. Backwashing of their screen baskets is full-automatic and requires little wash water, which is most important in this case because the sludge contains so much grease and fat. There are no filter belts that could become blocked by grease and fat. The operation costs of our screw presses are much lower than those of other dewatering machines.

The slaughterhouse and the wastewater treatment were started up in 2005. The results were excellent. The required limits for COD,

BOD, SS and fats were easily and instantly attained. Our technical solution and project management were so convincing that in January 2007 Danish Crown ordered another HUBER HDF unit with chemical pre-treatment and 120 m<sup>3</sup>/h capacity for their slaughterhouse in Blans. This unit will probably be started up in October 2007.

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