KUPFER Heilsbronn – A complete wastewater treatment concept for a meat processing company

Hans Kupfer & Sohn GmbH & Co.KG situated in Heilsbronn, Bavaria is one of Germany's biggest meet processing companies. Since their previous own wastewater treatment facilities were not longer capable of meeting increased capacity and clarification requirements, the company decided in 2006 to plan and pilot test a new wastewater treatment plant with the support of Resch engineering consultants and HUBER as equipment supplier. They wanted the new concept to meet higher requirements in terms of capacity and effluent quality, and requested a system that provides state-of-the-art technology in terms of environmental compatibility.

After thorough evaluation of the pilot tests that were carried out with the intensive support of HUBER, it was started to develop a most advanced wastewater treatment system for up to 1,600 m³ wastewater per day (100 m³/h max.). The new system, built in 2007 and successfully put into operation in 2008, consists in a combination of mechanical, physical-chemical and biological wastewater treatment plus additional sludge treatment.

A HUBER RakeMax® screen size 6300/952 with 15 mm bar spacing and two ROTAMAT® Rotary Drum Fine Screen Ro2 units size 1000 with 1 mm aperture and additional high pressure cleaning, installed in parallel, represent the mechanical core components of the preliminary treatment stage and ensure the reliable separation of all important solids loads. After intermediate buffer storage the wastewater is to a high degree homogenized as it is flowing into the following physical-chemical pretreatment stage. This treatment step focuses on the best possible separation of grease and suspended solids to achieve a reduction of COD and BOD loads. A HUBER Dissolved Air Flotation Plant HDF size 10 complete with a chemical treatment is used in this stage. The HUBER VRM® membrane plant for full biological wastewater treatment is at the core of the sewage treatment plant, with three VRM® ultrafiltration units size 30/400 being installed in parallel beside the aeration tank. This plant provides a total membrane surface of 7.200 m² for the most efficient separation of liquids and solids, i.e. water and activated sludge flocks. To meet the requirements of the requested princi-

Flooding of the HUBER VRM® membrane plant

ROTAMAT® Rotary Drum Fine Screen Ro 2 installed next to the HUBER Dissolved Air Flotation Plant HDF

ple of an overall wastewater treatment concept, a ROTAMAT® Disc Thickener RoS2S size 1 with polymer treatment was additionally installed to mechanically thicken the excess sludge. The generated flotate sludge needs no further treatment because it has been sufficiently prethickened by the highly efficient HUBER Dissolved Air Flotation Plant.

The plant worked excellently with a high operating stability very soon after plant start-up so that the predicted clarification results could be achieved and the required effluent standards for direct discharge met without problems.

ject in the field of modern, environment-orientated industrial wastewater treatment that represents an overall treatment concept including reuse options owing to the high effluent quality that allows for direct discharge and providing for secondary sludge utilisation for biogas production due to additional sludge thickening. The project certainly contributed that Hans Kupfer und Sohn GmbH & Co.KG were awarded the Bavarian Environmental Award 2009 donated by the Bavarian Landesstiftung foundation.

Andreas Böhm
Business Unit Industry

Parameter	Influent	Effluent	Reduction
COD - Chemical oxygen demand	1.600 mg/l	32.0 mg/l	- 98.0 %
BOD - Biological oxygen demand	1.100 mg/l	3.3 mg/l	- 99.7 %
N_{total} - Total nitrogen	70 mg/l	(3.1 mg/l)	- 95.5 %
NH_4-N - Ammonium nitrogen		1.0 mg/l	
NO_2-N - Nitrite nitrogen		0.1 mg/l	
NO_3-N - Nitrate nitroge		2.0 mg/l	
P_{total} - Total phosphorus	25 mg/l	0.2 mg/l	- 99.2 %

The sludge thickener not only achieves excellent results but also a significant reduction of the sludge volumes generated so that disposal costs and capacities are minimized. Furthermore, due to the improved solids content of the sludge and high energetic content especially of the flotate sludge, direct co-utilisation in an external biogas plant is possible.

Related to the aspects of operating costs and environmental compatibility of the entire system the possibility to reuse the treated wastewater is of special importance. The high quality of the membrane plant effluent permits the treated water to be discharged into a separate service water network and reused for cleaning, toilet flushing, irrigation of parks, vapour production, etc. to save resources.

In collaboration with KUPFER and their engineering consultants we have been able to establish a reference pro-

ROTAMAT® Disc Thickener RoS 2S