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[HUBER Belt Thickener Drainbelt DB: Test and operating results achieved on WWTW Köln-Stammheim](#)

Test and operating results achieved on WWTW Köln-Stammheim



Large scale trials in direct comparison with competitors resulted in the order for the HUBER Belt Thickener Drainbelt DB being awarded to HUBER. The start-up results of the finally supplied and installed unit even exceed the guaranteed performance data and test results of the trial unit significantly. Since April the Drainbelt has proven its efficiency and minimized the operating costs for excess sludge thickening.

WWTW Köln-Stammheim is designed to handle the wastewater of 1.57 million PE. The excess sludge from low load activation has to date been thickened mechanically in four centrifuges without the use of polymers prior to being discharged into digestors. Since the maintenance requirements and operating costs for the 15 year old centrifuges were high, the engineering office Dr.-Ing. Ralf Denkert worked out a detailed comparison of solutions to upgrade or replace the centrifuges. The most economic solution turned out to be the replacement of the old centrifuges with belt thickeners. The crucial factors for this decision were the significantly reduced costs for energy and maintenance despite the use of polymer and the improved thickening degree that is positive for digester operation. Other factors, which do not directly relate to monetary aspects, are easy maintenance and repair and the related high availability of belt thickeners. Within the scope of detailed planning a limited invitation to tender was extended that requested an offer for four belt thickeners with a maximum capacity of 100 m³/h each or 1000 kgDS/h. The project was divided into two lots to investigate the impact of polymer doses in the thickening process on the properties of digested sludge. The first lot demanded the installation of only one belt thickener in order to observe its performance data and sludge dewaterability over six months. The second lot adds another three belt thickeners to fully replace the previous centrifuges. The precondition for the decision to place the order for the complete project with Schachtbau Nordhausen GmbH who included in their offer the HUBER Drainbelt DB 2.0 was the fact that the guaranteed operation values had been proven in one week large scale trials.

- Throughput: 30 m³/h (with Drainbelt DB 0.5)

- Specific amount of coagulant agent: 3.2 kgWG/tDS
- Thickening degree: 6.0 % DR
- Filtrate load: 0.12 gDS/l
- Separation degree: 99.0 %
- Specific current consumption: 0.07 kWh/m³

The DB 2.0 was delivered and commissioned with the first lot. The operating results of the finally ordered and supplied unit exceeded the results guaranteed with the trial unit, partly significantly.

- Throughput: 80 or 100 m³/h
- Inlet freight: 800 – 1000 kgDS/h
- Specific amount of coagulant agent: 2.6 kgWG/tDS
- Thickening degree: 6.0 % DR
- Filtrate load: 0.05 gDS/l
- Separation degree: 99.6 %
- Specific current consumption: 0.065 kWh/m³

The minimized solids load in the filtrate water is due to the higher loaded water from filter belt washing being returned to the belt thickener inlet. This cycle operation allows for finest solids particle to be flocculated again and removed virtually completely from the filter belt. Two control circuits for automatic operation are provided to further optimize and stabilize the thickening process. A turbidity probe in the thin sludge inlet continuously measures the variation in solids content (6 – 16 g/l). The delivery flow of the thin sludge pump is adjusted accordingly and automatically to ensure constant solids loads and optimal flocculation with a constant polymer dose. The second control circuit permits the adaption of belt velocity to the solids content of the thickened sludge. Since April the Drainbelt DB has been in a six months trial operation. The guaranteed values have since then always been met. Until it will be decided on the other three belt thickeners, the operating staff will investigate whether the very low polymer doses have any negative impact on digester operation.

by Harald Neumann , Business Unit Sludge Treatment

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