

Efficient sludge treatment, process control in real time

Reliable measurement of total solids for wastewater treatment plant with Teqwave MW 500



The Wieseverband Lörrach wastewater association operates the Bändlegrund wastewater treatment plant in Weil am Rhein, Germany. The wastewater treatment plant has existed since 1983 and currently has a capacity of 290,000 PE. In addition to wastewater from the cities of Lörrach and Weil am Rhein, the plant also treats wastewater from the drainage area of Efringen-Kirchen and the Lower Kandertal wastewater association.

"For us, it was very important that we optimize process control in sludge management at the plant in light of the increasing legal requirements in operation. We achieved this thanks to Teqwave MW 500. Continuous in-line measurement of the solids content provides reliable measured values that can be used as the basis for process visualization and automation. The comparison measurement in the laboratory confirmed the accuracy and reliability of Teqwave MW 500."

Steffen Mehlhorn
Managing Director of the Wieseverband
wastewater association



Bändlegrund wastewater treatment plant in Weil am Rhein, Germany



Steffen Mehlhorn, left, and Erich Gersbacher, Technical Plant Manager

Due to increasing legal requirements, wastewater treatment plants are continuously required to review their processes and optimize them, if necessary. In this context, operators of the Bändlegrund wastewater treatment plant in Weil am Rhein, Germany saw potential for optimization in sludge management. The installation of the Proline Teqwave MW 500 in-line measuring device from Endress+Hauser made it possible to optimize multiple areas at the same time.

The customer requirement

One optimization approach was the removal of primary and secondary sludge from the hoppers of the primary clarifiers. This process was previously controlled by the runtime of the sludge removal pumps. Adjusting the runtime required the results of a manual sludge level measurement as well as experienced personnel. Runtimes that are too short lead to the accumulation of sludge during pre-clarification, while runtimes that are too long lead to hy-

draulic overload on the thickener, unnecessarily long pump runtimes and increased power consumption. Too much accumulated sludge carries the risk of digestion in the primary clarifier, which results in the reduction of gas yield in the digester.

Efficient management of the thickener reduces the hydraulic load on the digester, thus reducing the energy required to heat the sludge. Furthermore, a longer retention time of solids in the digester leads to improved gas yield. Previously, intermediate balancing of sludge from pre-clarification using real-time data was not possible.

Another challenge is the solids-based polymer dosing when dewatering the slurries with a solids content of 2 to 4 %TS. The solid content was previously determined manually each week and the amount of polymer was added to the chamber filter press in proportion to volume. Overdosing leads to a greater necessary effort to clean the chamber filter presses, potentially

causing a plant shutdown. Underdosing produces a worse dewatering result and thus increased disposal costs.

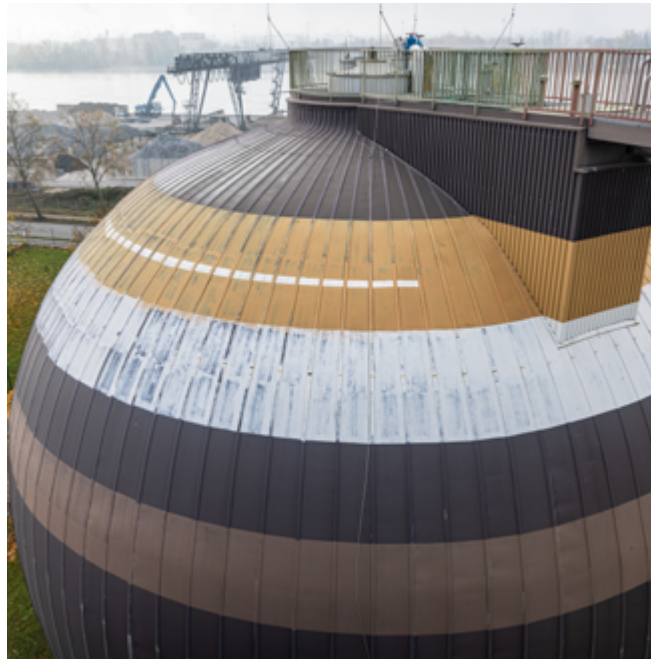
Our solution

Proline Teqwave MW 500 from Endress+Hauser is an in-line measuring device that displays the total solids in sewage sludge in %TS in real time using microwave transmission. Comparison with laboratory values has confirmed the reliability of the measured values. Thanks to direct measurement in the inlet to the thickener, the flow of sludge can be balanced and pump runtimes can be automated. The solids content at the start of the time-controlled sludge removal is approx. 3 to 4 %TS. When the value is less than 0.8 %TS, the pump is switched over to the next hopper.

During sludge dewatering, real-time solids measurement enables the amount of polymer to be dosed in the inlet of the chamber filter press optimally at all times, even in case of changes to the solids content. A laboratory calibration was performed at the start of the test phase; since then, Teqwave MW 500 has run reliably for more than a year without adjustments.

The result

- Increased operational safety thanks to process stabilization
- Reduced energy and polymer consumption thanks to optimized sludge management
- Process control in real time
- Faults are detected more quickly
- Balancing of sludge flow possible
- Reduced manual effort
- Optimized runtimes of the pumps
- Increased digester gas yield



Devices used

Raw sludge: Proline Teqwave MW 500 (DN 200)

Digested sludge: Proline Teqwave MW 500 (DN 100)



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