APPLICATION NOTE

Water & Wastewater

Monitoring sedimentation sludge in an industrial sewage treatment plant

- Preventing sludge washout from the secondary sewage treatment
- Using an optical sludge measuring system to control sludge discharge
- Trouble-free measurement despite extremely adhesive sludge loads

1. Background

A worldwide textile manufacturer runs a production facility and adjoining sewage treatment plant in Austria. The facility thoroughly cleans the company's industrial wastewater before supplying it to a municipal sewage treatment plant.

2. Measurement requirements

After the biological purification stage, the activated sludge is transported to two oblong secondary clarifiers. There, the sludge is separated from the treated wastewater. The waste sludge must then be removed from the system to prevent it from flowing into the effluent.

The customer was looking for a suitable measuring instrumentation to continuously measure the interface between the settled sludge and the clarified water zone above it and to remove the settled sludge promptly. The composition of the wastewater is extremely complex and highly adhesive.

3. KROHNE solution

The OPTISYS SLM 2100 optical sludge measuring system prevailed in a comparative test using an ultrasonic measuring device over the course of several months. The customer uses the KROHNE system in both clarifiers. The sludge measuring system was mounted on a frame on the edge of each tank. Two proximity switches ensure that the optical sensor of the measuring system is not torn off by the scraper passing by intermittently. Due to the demanding nature of the medium, KROHNE recommended the use of a device variant with integrated flush cleaning. In addition, both measuring systems were equipped with trace heating for the supply line to the rinsing unit as well as a frost protection cover. This ensures smooth operation, even in particularly wintry weather conditions.

KROHNE

The KROHNE system is designed to measure the sludge blanket, fluff level and sedimentation profiles in industrial wastewater treatment. Its optical sensor reaches the bottom of the tank. It detects all sludge phases and provides accurate concentration and sludge level measurements. This means it is also able to measure the sludge level continuously (zone tracking) and hence monitor one specific "zone" (e.g. for pump control during de-sludging).

Measuring the sludge level in the clarifier

OPTISYS SLM 2100 with frost protection cover during winter operation

Integrated flush cleaning for the sensor

4. Customer benefits

The operator benefits from seamless monitoring of its sedimentation process. The OPTISYS SLM 2100 sends out an alarm if a defined threshold is exceeded. This way, the customer can remove the settled sludge in a timely manner. This effectively prevents the downstream processes from being overloaded with waste activated sludge. Measuring the sludge level allows the customer to draw conclusions about the settling properties of the sludge. The sludge level measuring system also provides information to optimise both sedimentation and sludge quality.

The sludge measuring system adheres to the 180° NIR LED measuring principle, which has proven itself to be considerably more effective in this application. Unlike with ultrasonic measurement, echo reflections off the walls of the clarifier have no impact on the optical measurement. Fluff and floating sludge have an equally minimal impact on the performance of the KROHNE system. The OPTISYS SLM 2100 can categorically exclude the resulting measuring errors experienced by ultrasound-based systems.

5. Product used

OPTISYS SLM 2100

- Optical sludge measuring system for the monitoring of settled sludge in industrial wastewater treatment
- 3 measurement modes for sedimentation profile, sludge level and fluff level as well as zone tracking
- Optionally available with automatic flush cleaning for low maintenance
- Accurate and colour-independent measurement at a depth of up to 10 m / 32.8 ft.
- No interference from fluff or floating sludge
- Durable stainless steel sensor and device housing
- Integrated electronics: 2 x 4...20 mA, 3 relays, limit switches

Contact

Would you like further information about these or other applications?
Do you require technical advice for your application?
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