



Practice Report

Sludge thickening

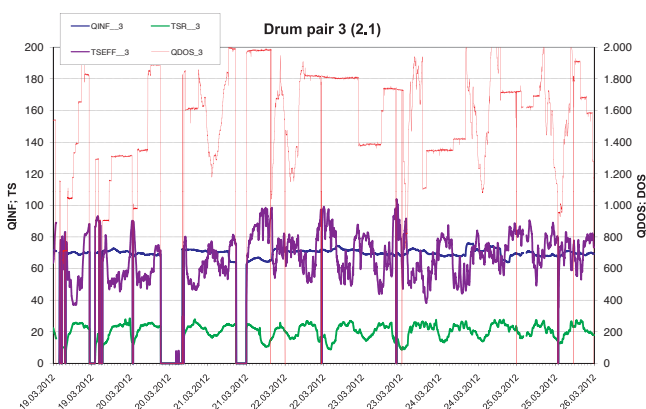


RTC – Reduces polymer and increases biogas production

The initial situation

The wastewater treatment plant in England has a capacity of approximately 1.9 million PE and is operated by Thames Water. The primary sludge from the primary sedimentation basins is consolidated in a sludge thickener and it then undergoes mechanical sludge thickening before it is sent to the sludge digestion stage. Before installation of the RTC113-ST open-loop control/closed-loop control module, polymer addition was based on laboratory measurement values of the sludge concentrations, which were taken every two hours; an adjustment of the metering to the current sludge concentration and composition was therefore not possible. The result was high polymer use and strongly fluctuating, low solid concentrations in the thickened sludge combined with low gas yield during digestion.

Graphic 1 shows the loading volume (blue), the solid concentration in the influent (green) and in the thickened sludge (purple) as well as the polymer volume (red) measured at one thickener in the initial situation.

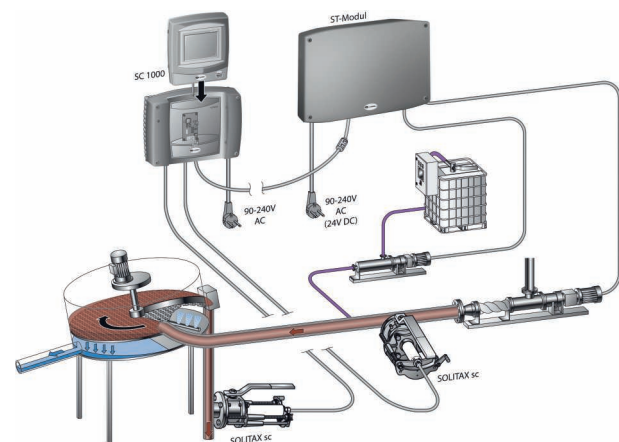


Graphic 1: Operational results before the use of the RTC113 ST module

With influent concentrations between 10 g/L and 30 g/L as well as manually set polymer volumes, the TS concentration varies in the thickened sludge between 38 g/L and 100 g/L. This leads to an excessive use of polymer and can cause further operational problems during sludge treatment.

Objective:

In order to reduce the use of polymer, increase the TSS concentration in the thickened sludge and increase the gas yield, the operating company sought out a polymer metering method dependent on the actual sludge load and sludge composition.



Graphic 2: Working principle of the RTC113 ST module

The plant

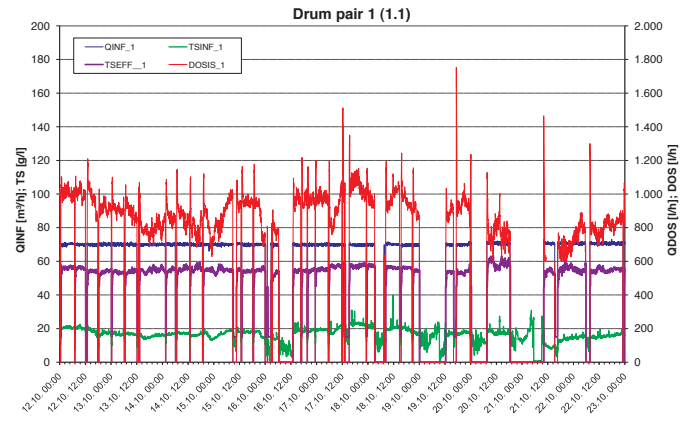
- Capacity: approximately 1,890,000 PE
- 12 drum thickeners

The advantages

- Increase in the solid concentration in the thickened sludge from 4.5% to 5.5% on average.
- Increase in biogas production of 6%.
- Reduction in polymer use of 35%.
- Reduction in the cleaning and maintenance work on the thickeners, as overdosages are avoided.
- Easy integration into the existing plant control.



The measurement data



Graphic 3: Operational results with use of the RTC113 ST module.

The solution

For measuring the solid concentrations in the influent of the thickener and in the thickened sludge, SOLITAX sc solid probes with corresponding installation fittings were used, as shown in Image 1. Based on the load volume and the solid measurement in the influent of the thickener, the RTC113 ST module sets a specific polymer volume (kg of polymer per t of solid). Through the measurement of the solid concentration in the thickened sludge, the load-dependent metering volume is corrected in order to achieve the required target value for the solid concentration in the thickened sludge in the event of varying sludge properties.

Through the installation of the RTC113 ST module, the sludge thickening process has been optimised considerably at this wastewater treatment plant.

Graphic 3 shows the results achieved at one thickener. Based on the solid measurements and the ST-RTC module, polymer addition has been reduced and the required solid concentration in the thickened sludge (here 5.5%) can also be set.