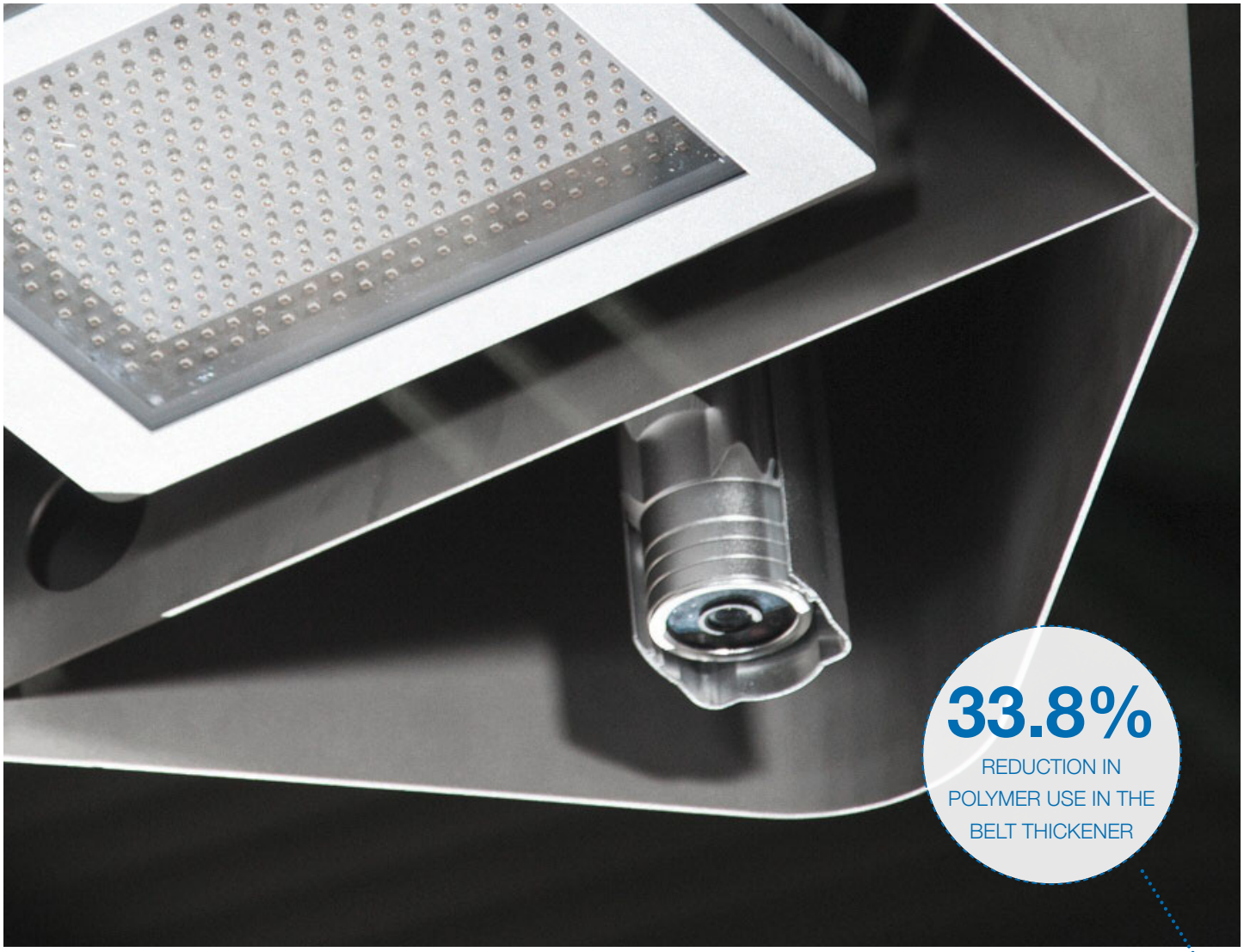
ANDRITZ Separation

Smart sludge control

Fully automated polymer savings and increased biogas production with RheoScan



▲ RheoScan detailed view

The challenge: Reduce polymer costs and increase overall efficiency

In Ljubljana, Slovenia, one particular customer in the wastewater industry has continuously sought to improve efficiency. That is why the plant owner tested our RheoScan, an automated, optical polymer measurement and dosage system at the belt thickening stage to reduce polymer consumption and enhance digester performance, in 2014. However, rapid fluctuations in incoming sludge quantity and quality made it essential to optimize the system prior to implementation. The following targets were set for a new test series in 2015 in order to verify the performance and economic viability of the new test installation:

- Reduce polymer consumption at the belt thickener to achieve at least 5% dry solids at the thickener discharge
- Examine the effects of reduced polymer dosage on digester performance, biogas production, and polymer consumption in centrifuge dewatering
- Demonstrate the reliability of the RheoScan System in the long term

All of these criteria had to be fulfilled, despite challenging operations with highly dynamic incoming sludge. The parameters for the RheoScan tests had to be carefully monitored, optimized, and correlated with belt speed controls in order to achieve optimum results.

Our solution: Real-time optimization for KPIs and advanced data analysis

Given the wide range of variables involved in the test, an array of process data had to be collected and fed into ANDRITZ SEPARATION's SMART Service platform. This included specific KPIs, such as polymer savings at the belt thickener and decanter centrifuge, RheoScan availability, and biogas production.

The actual storage capacity of the digester and of other intermediate steps had to be taken into account. And the reaction kinetics for biogas generation as well as the delay in feeding sludge from the belt thickener to the decanter were recorded carefully in real time. Thanks to remote access and processing of plant performance data during the testing process, ANDRITZ SEPARATION and the customer succeeded in making the necessary adjustments and programming the system to achieve all KPIs over the course of the test period.

Results: Total savings providing an impressive ROI

The test operations were a resounding success, enabling the plant to achieve significant savings thanks to the RheoScan system. We were able to confidently calculate annual polymer savings of 33.8% in the belt thickening stage alone, plus 16% polymer savings in the dewatering stage. In addition, an annual production increase for biogas of 11.7% was predicted. Together these efficiency gains would give the plant a total amortization period of only a few months for its RheoScan system. The fully automated system used for more than 85% of the test period also reduced the need for manual supervision and Intervention, while ensuring high reliability.

No existing operational performance standards were compromised by the reduced polymer consumption, making full implementation of RheoScan the obvious choice after test operations.

16%
REDUCTION
IN POLYMER USE
IN THE DECANTER

11.7%
ANNUAL INCREASE
IN BIOGAS
PRODUCTION

"To achieve an amortization period of only a few months is a rare achievement for any investment. There has been great collaboration with ANDRITZ SEPARATION's service team, and this was essential for us to achieve our goals together."

VESNA MISLEJ, PROCESS TECHNOLOGY MANAGER, JP VODOVOD-KANALIZACIJA, LJUBLJANA

SERVICE

ANDRITZ Separation

Key equipment

▲ RheoScan installed at a gravity belt table

Benefits

- Amortization period of only a few months
- Cost savings of up to 40% or more due to reduced polymer consumption
- Increase in gas yield as a result of optimized polymer dosage (for biosludge applications using a digestion process)
- Increased plant reliability and machine operating stability
- Operates without requiring supervision
- A patented technology that works with any manufacturer's automated polymer delivery system
- CE-certification and UL508A optional
- Massive reduction of overspills

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