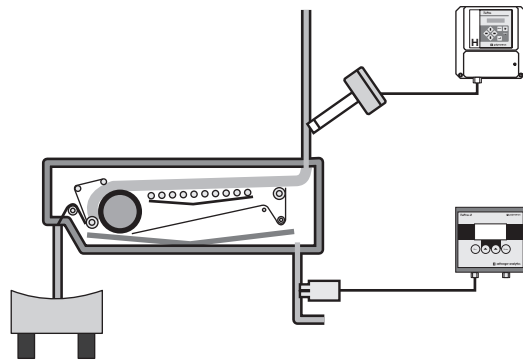


# Belt filter press monitoring / control in wastewater treatment plants

## application note



*In a belt press thickening application, an HC-300 High Concentration sensor with a TxPro-H transmitter monitors the feed solids (top right) and an RD-240 sensor with a TxPro-2 transmitter (bottom right) monitors the filtrate.*

### Description

A belt filter press squeezes sludge between moving belts to remove liquids from sludge solids. Belt filter presses are used to thicken primary sludge which produces thickened sludge or to dewater thickened sludge which produces sludge solids (cake). Cake must be disposed of by the plant.

### Critical factors

The critical variables that determine the efficiency of the press are the feed solids characteristics, polymer dosage and belt type, tension and speed. To improve particle flocculation, polymers are routinely mixed with feed solids. Polymer flocculation produces a sludge that can withstand the pressures generated during the dewatering process without extruding from between the dewatering belts.

The porosity of the belt must be carefully selected to yield the desired cake solids concentration. Belt tension can be increased to produce a drier cake, but this procedure can force solids through the belt, contaminating the filtrate. Increasing the belt speed has similar positive and negative affects.

### Feed

The sources of belt filter press feed solids are primary and thickened primary sludge or waste activated sludge (WAS) mixed with primary sludge.

Deviations in the feed solids composition require adjustments in the feed volume and polymer dosage to maintain cake concentrations. The feed solids and filtrate must be monitored to direct the adjustments.

### Detention time

Sludge flows through a belt filter press in minutes. Fluctuations in the flow-through time depend on the belt speed, which can be adjusted. The belt speed must be adjusted to keep pace with the feed rate.

### Effluent

Filtrate is returned to the head of the plant and must be monitored for suspended solids. Deviations from the expected solids concentration can be caused by polymer underdosing or overdosing and by belt filter press adjustments.

Cake solids are incinerated or disposed of as landfill or fertilizer. Cake concentrations range between 15% and 34% depending on the feed solids, polymer dosage or belt filter press setup. The cake concentration, wetness and chemical content are important issues for cake disposal.

### Zellweger Analytics solutions

For this application, both feed-forward and feedback data are desirable. For belt thickeners, an HC-300 sensor with a TxPro-H transmitter has the necessary range (0% to 10%) to provide feedback on the thickened sludge concentration.

For feedback data on the filtrate, the RD-240 sensor with a TxPro-2 transmitter can track concentrations from 0 g/l to 10 g/l. Depending on the requirement, the sensor can be pipe-mounted through a ball valve, mounted to a PVC pipe for suspension in a channel, or mounted in a degassing tank when foam is present. An HC-300 sensor and TxPro-H transmitter can track concentrations from 0% to 10%, monitoring the feed solids.

With data from the sensors, an operator or automated controller can adjust the polymer dosage to achieve a consistent cake yield.

*This publication is not intended to form the basis of a contract. The company reserves the right to change design and specification of its products without notice.*

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