



Water Quality Analysers



PolySense - Polymer Control for Sludge Dewatering

The PolySense utilizes an online measurement of the cake dry solids and an online measurement of the solids in the centrate/filtrate to control the polymer addition and the sludge feed rate, in order to optimise the process.

This gives you:

- Typically 25% reduction in polymer usage
- Increased cake solids
- Reduced transportation costs
- Less foaming
- Reduced solids in the centrate/filtrate
- Reduced operator reliance
- Capital payback, often in less than 18 months



"PolySense has revolutionised the dewatering of our sludge, we get drier cake, less cost and less process upsets", David Bennett, UK

Why the Need for Automatic Polymer Control?

The Problem

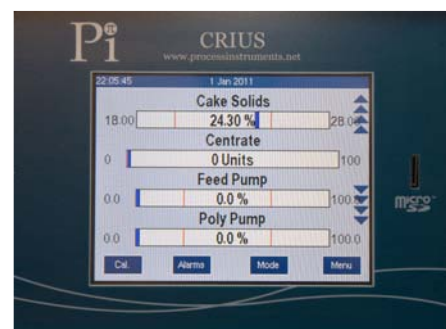
The consequences of overdosing polymer to a dewatering device such as a centrifuge are much less than the consequences of underdosing and with time pressures on operators, this inevitably leads to overdosing on most centrifuges and belt filters. This overdosing gives the operator a time 'buffer' against process variations.

Overdosing of the polymer can lead to:-

- increased polymer costs
- increased solids in the centrate
- increased foaming in the centrate
- decreased solids in the cake
- increased transport costs per tonne of waste
- increased load on the works
- reduced efficiency of driers and digesters

The Solution

The PolySense is a simple, but effective and reliable method of controlling the polymer dosing via the polymer dosing pump and in some cases the feed rate to the centrifuge. It does this by making reliable online measurements of the dry solids of the cake, and of the suspended solids in the centrate/filtrate, and in some cases the feed solids. These measurements are the key to the success of the PolySense and the suspended solids instrument includes debubbling technology and self-cleaning where required. Essentially the PolySense measures the suspended solids in the centrate (or sludge feed) and the dry solids in the cake and adjusts the polymer dosing pump, (and in some cases the feed pump), to maintain those ranges of cake solids and centrate suspended solids that produce the best outcomes for the plant. Whilst the PolySense does not monitor or control all aspects of the sludge dewatering equipment such as the speed of the centrifuge, it provides a reliable and much improved process control to the more traditional manual control.

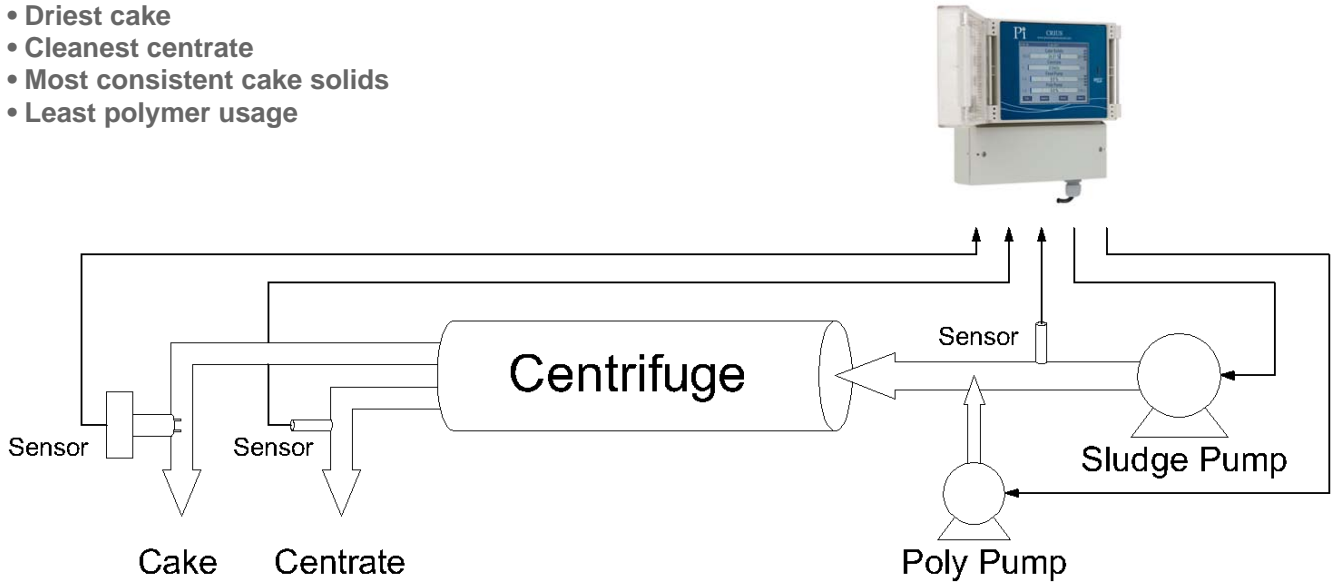


Multiple Control Options

During normal operation the PolySense will control the polymer to keep the Dry Solids in the cake and the Suspended Solids in the centrate to within user selectable ranges. These ranges are set up on commissioning and are likely to give a good compromise on polymer usage, cake solids and loading on the works. There are occasions, however, when reduced polymer isn't the most important outcome. It may be that there is pressure on the works and reduced loading going back to the head of the works is more important, or perhaps the cake is being transported off-site so the driest possible cake solids is the most important outcome.

Each PolySense is equipped with five sets of control settings that can be set up on commissioning to allow the operator to easily select the appropriate control setup for the plant requirements at the time. e.g.

- Normal operation
- Driest cake
- Cleanest centrate
- Most consistent cake solids
- Least polymer usage



Case History

In late 2008 a compliance engineer for one of the UK Waste Water Utilities contacted Pi in order to start the process of determining the best instrumentation to control his Alfa Laval dewatering centrifuge. He had determined that by manually controlling the centrifuge and constantly making small adjustments to the poly dose he could significantly reduce his poly usage whilst maintaining the cake solids. Having determined this manually he approached Pi seeking to automate the process. This was a perfect application for the PolySense.

In consultation with the engineer, it was determined that he could achieve his goals using a two point measurement system (online cake solids and online suspended solids in the centrate), with the appropriate control algorithm feeding back to the DCS that would in turn control the polymer feed pump. His total cost including installation and commissioning was £26,000 and his average reduction in poly usage was 25% giving a payback inside 18 months.

“Although the financial justification for the project was based on polymer savings alone the additional benefits were significant. The reduction in Carbon Footprint is as yet unquantified but significant, and the improved consistency of cake solids has resulted in higher average

cake solids and a reduction in transportation costs. The operators have all bought in to the system and are happy that they are freed up to carry out their other duties secure in the knowledge that if anything should go wrong they will be informed via the alarms generated from the control signals. The company are now beginning the process of rolling the system out across other sites.”



GPRS Remote Access is included as standard with CRIUS® PolySense

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