



## ***Blocked Chute Detection System in Animal Feed Production Application***



## Microwave blocked chute detection system improves animal feed production

Hycontrol's Microsense microwave-based blocked chute detection systems are playing a critical role at a major animal feed plant in the UK. The Microsense installations provide the early detection of product bridging on feed production vessels, resulting directly in significantly reduced cleaning requirements and improved production.



During the manufacturing process, animal feed pellets are produced by mixing dry powder product with molasses and steam. This combination produces a challenging product to manage and periodic bridging across the chutes of the process vessels is inevitable. Without an effective way of detecting the start of a blockage, the process continues until the chute becomes completely blocked. This then requires a time-consuming clean-up procedure, resulting in loss of production time and product wastage, together with additional costs from wasted energy for the unnecessary steam production.

Given the challenging characteristics of the materials involved in the feed manufacturing process, any control system for these applications has to be non-intrusive. Probes or sensors mounted within the chute would rapidly become coated in process material and rendered ineffective. In addition such sensors can be prone to damage during routine cleaning..

The manufacturer had already tried several different measurement technologies to resolve the problems, but without success. However, based on their successes in similar difficult applications, Hycontrol engineers were confident their innovative Microsense system would provide a practical solution. As a result, it was agreed to set up a trial on one of the chutes to provide an early warning of when bridging starts to occur.

Microwave technology in level measurement has previously been regarded as unreliable, due to the low signal strengths over distance. By comparison, Hycontrol's range of Microsense microwave level switches are based on a new generation of sensors utilising superior heterodyne detection methods. The technology has the ability to obtain a proportional output to the power received, a distinct advantage over older, unreliable diode microwave sensors. The result is an increase in operating range up to 40 metres and far superior product penetration, all without having to increase power.

The switches are simple to install and set up, offering a safe, non-contact, non-intrusive alternative to expensive nucleonics for many applications on powders, liquids and solids. They have a proven track record and are suitable for demanding applications involving, for example, corrosive, high dust, gaseous or vibration environments.

The Microsense system utilises a matched pair of devices, consisting of a transmitter sensor and a receiver sensor. During operation the transmitter emits a continuous, safe low-power microwave beam and the output relay of the receiver 'head' is energised or de-energised by the beam being obstructed by material. This has the obvious advantage of being completely non-contact – a distinct advantage when dealing with a sticky, difficult product like molasses and damp powder.

For the trial, the transmitter and receiver heads were installed on either side of the chute which had previously been suffering from the blockage issue. The devices' sensors were mounted behind a plastic 'window' to ensure a flush fitting to the chute wall, thereby protecting the sensor and eliminating any product ingress. The microwave beams pass unhindered through the window and are also unaffected by normal product coating on the chute walls.



Following the thirty-day trial, the company have placed orders for several more Microsense blocked chute switches at the same site. A spokesperson concluded: *"Having tried a number of unsuccessful options for detecting blockages, we were somewhat sceptical at first, but the Hycontrol system works extremely well. Prior to the installation we were having to carry out a thorough cleaning of the chute up to three times a day. Now the early detection of any bridging initiates a warning alarm, allowing us to shut down the process. Releasing the blockage at this stage only takes a few minutes, causing minimum disruption to production and we now only have to carry out a thorough cleaning every two weeks."*

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