

Application Notes

Food and Beverage

RD400

Smar Guided Wave Level Transmitter. Application at Cargill - Uberlândia - MG.

Application

Level measuring applications of solid industrial products through guided wave transmitters are an innovation for many industries in Brazil. A lot of times, solutions with load cells, sonars or level measurement for hydrostatic pressure cannot fully serve those processes, because such equipments are normally used on liquid processes.

At Cargill Agrícola S.A, starches and sweeteners unit in Uberlândia, Minas Gerais state, for example, corn grains level is measured, after being previously treated with water and other chemical products, so that, subsequently, that corn is grinded. Then the raw material for the separation of several end products is obtained.

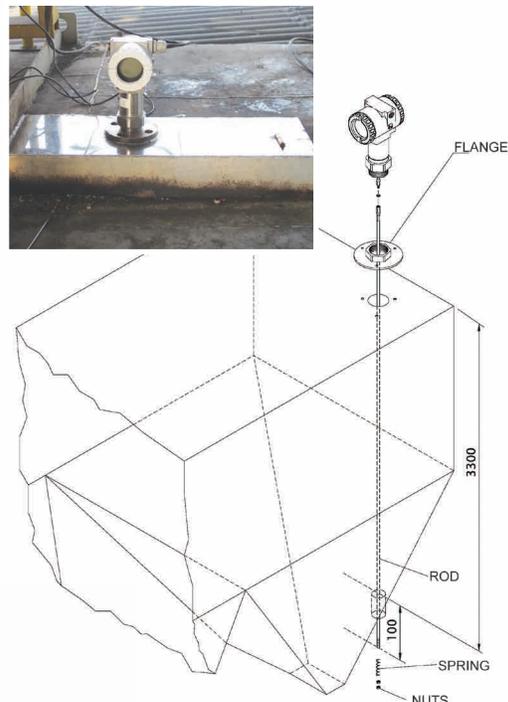
In this steep tank, known as Hopper, Cargill currently uses load cells, through a system of closed control screening. But these cells provide great errors in the case of weight control, and not of level control - which is wanted.

Dry corn grains have a very low dielectric constant, which generates low reflection signs for any guided wave meter. However, in this case there is the constant presence of water, even if in small quantity.

This provides optimum reading to the equipment, due to the water high dielectric constant.

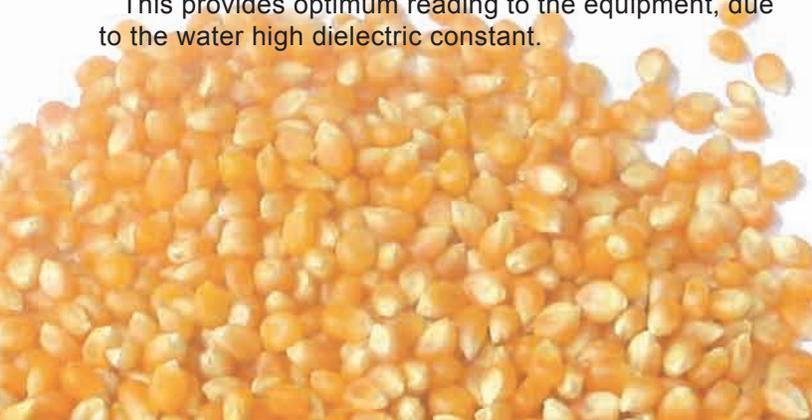
Installation

So, a **RD400** with single rod in 316 stainless steel was installed in the Hopper steep tank, as shown on the sketch below.



Sketch of installation in the Hopper. Detail of the installed equipment

The bottom of the reservoir was perforated and a spring was connected at the end of the rod to provide some freedom space to the set on the vertical position. That softens the process tensions on the probe, since a solid material constantly bumps on the probe.



Conclusion



Responsible for the projects:
Wanderson José de Resende.

According to Wanderson José de Resende, responsible person for the projects and instrumentation of the factory starch section, with **RD400**, the measuring reliability that lacked before, improved significantly: "The old system presented measuring errors, turning the process unstable", he affirms. With Smar's **RD400**, the principal benefits were "reliability and precision, because now we know the real level", and he completes: "In spite of our being in the test phase and small adjustments in the control are necessary, the **RD400** already presents reliability in the process control".

waves, guided in a given ambient (in the **RD400** case, its probes), suffer reflection when meeting another ambient with different dielectric constant, due to the impedance change.

The **RD400** depends basically on the dielectric constant in the ambient whose level is measured. For an ambient with humidity, the waves reflection improve significantly due to the high dielectric constant of the water.

Elements as dust, internal obstacles in the tank (level keys, filters, etc.), bubbles in the surface, among others, are mostly ignored by the equipment, since the waves are guided by probes, without loss of power. For each type of process, there will be the need for a different probe, which can be single or dual rod, single or dual cable or a coaxial terminal. What will determine which one will be type are parameters like the tank height, the installation or not of **RD400** in the communicating vessel, the dielectric constant of the process, among others. Consult our representatives for more information.



Features

The **RD400** uses Time Domain Reflectometry (TDR) technology, principle widely used in civil construction, telecommunication, agriculture, among other areas, and recently in industrial process level measuring. This principle is based on the concept that electromagnetic

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