



APPLICATION NOTE Food & Beverage

Measuring layer thickness in a centrifuge

- Continuous measurement of layer thickness when filling centrifuge
- Controlling the layer thickness during the spin process
- Automated filling process

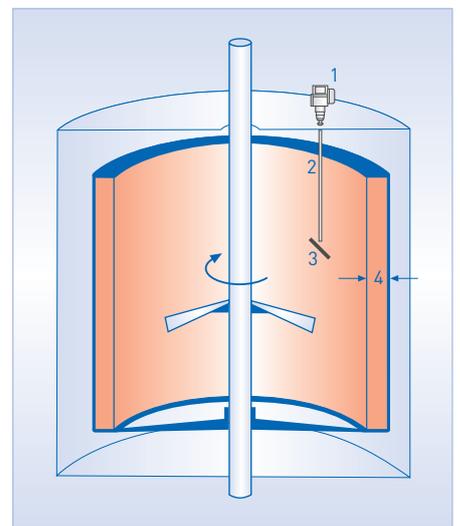
1. Background

A sugar producer fills a centrifuge with hot molasses sugar to press the moisture out of the molasses at high speed. The thickness of the layer of molasses on the wall of the centrifuge is reduced in the process. The layer thickness is thus a measurement of the moisture content of the layer of molasses.

2. Measurement requirements

The centrifuge is the shape of an upright barrel with a diameter of approx. 1.5 m / 5 ft. The filling process only lasts 5-10 seconds. The layer thickness on the wall of the centrifuge is to be continuously measured during this time so that the filling process can take place completely automatically. The measuring device can only be installed from above but must measure at a 90° angle. This is done using a 45° mirror which is attached to the end of a 700 mm / 2.30 ft waveguide and reroutes the radar waves. There is 150 mm / 0.5 ft between the molasses layer and the waveguide.

- 1 Measuring device
- 2 Waveguide
- 3 45° tilted mirror
- 4 Layer thickness of molasses



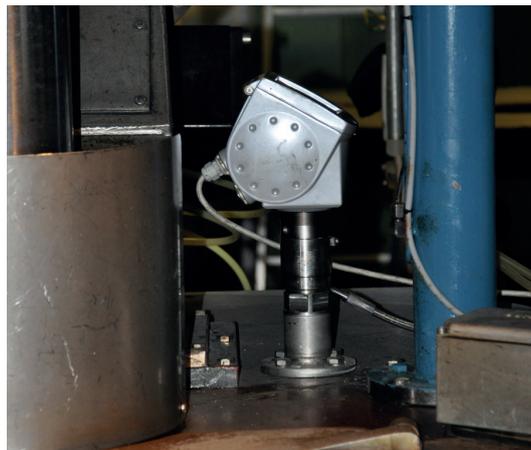
Centrifuge in detail

3. KROHNE solution

For this type of application, KROHNE supplied 4 OPTIWAVE 7300 C radar level measuring devices with DN 50 / 2" horn antennas and G 1½" connection. The existing constructions were used for mounting.

Thanks to FMCW radar technology, the OPTIWAVE level meters measure over a very wide dynamic range. That is why neither the minimally reflective surface of the molasses layer nor the high speed of the centrifuge when filling and during the spinning process affect the measurement of the layer thickness.

Following each spin cycle, all parts that come into contact with the molasses sugar are automatically cleaned with water to avoid any caking.



Installed OPTIWAVE 7300 C

4. Customer benefits

The customer is now in a position to completely monitor and automate the entire process of extracting the moisture from the molasses sugar. At any time, both while filling the centrifuge and during the spin cycle, the layer thickness on the wall of the centrifuge can be measured and the production process can be controlled accordingly, saving both time and money.



Waveguide with 45° tilted mirror

5. Product used

OPTIWAVE 7300 C

- Precise measurement in harsh conditions – even in tanks with agitated surfaces, foam or internal objects
- Product temperature up to 200 °C / 390 °F and operating pressure up to 40 bar / 580 psi
- For measuring ranges up to 80 m / 262 ft
- PACTware and DTMs are part of the standard scope of delivery
- Standard measurement error $\leq \pm 3 \text{ mm} / \pm 0.12''$
- 2-wire connection technology, minimal wiring expense
- Maintenance-free



Contact

Would you like further information about these or other applications?
Do you require technical advice for your application?
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