APPLICATION NOTE

Food & Beverage

Flow measurement of tomato paste with entrained gas

- Ensuring consistent product quality in the production of tomato ketchup
- Repeatable and reliable flow measurement of a complex medium with gas fractions
- No more process interruption and production waste

1. Background

A sauce manufacturer operates several production sites in South America. In one of these plants, the company produces high-quality tomato ketchup, which is supplied to retail and wholesale companies as well as other customers in the food industry.

2. Measurement requirements

To help the ketchup maintain its consistency from batch to batch and over a long period of time, a tomato base is finally sieved until a silky consistency is achieved. Passing this paste through the thin filters generates entrained gas naturally, which can be as high as 20% by volume.

As the tomato base is the main raw material of the final product, flow measurement of this fine paste plays a key part in the production process. In order to solve this application, the customer had so far opted for a conventional Coriolis meter from a manufacturer well known in the food and beverage industry. This flowmeter, however, was not up to the challenge of entrained gas present in the fine tomato paste. Whenever entrained gas occurred in the process this Coriolis flowmeter simply stopped measuring, thus affecting the consistency of the sauce recipe which in turn created a lot of waste.

This was highly inconvenient and not at all acceptable for the customer. For this reason, they were searching for an alternative Coriolis mass flowmeter that was able to measure the tomato base product reliably and with excellent repeatability – even in the event of entrained gas.

KROHNE

3. KROHNE solution

KROHNE recommended using the OPTIMASS 6400 C. The Coriolis mass flowmeter prevailed in a test against the previously installed Coriolis meter. The KROHNE flowmeter did extremely well, handling the very complex flow conditions of the silky tomato paste smoothly without interruption.

Featuring Entrained Gas Management (EGM™), this Coriolis mass flowmeter is ideally suited for all sorts of liquids and pastes with gas entrainment. It maintains operation over a wide range of gas volume fractions and complex flow conditions.

The Coriolis mass flowmeter was supplied with tube size DN50 and wetted parts in stainless steel (316L). It was installed with hygienic process connections according to DIN 11851. The twin bent measuring tube of the device is EHEDG certified and thus guarantees simple cleaning. The OPTIMASS 6400 was provided with basic analogue output as per customer request. Digital output options (e.g. PROFINET) could have also been selected by the customer.

4. Customer benefits

With the help of the OPTIMASS 6400 C the main ingredient in the tomato ketchup is continuously measured. This not only helps the customer maintain their consistently high-quality recipes. Product spoilage is also significantly reduced, allowing the customer to save on both resources and costs on a permanent basis.

The salsa manufacturer is extremely satisfied with the technical advice and the performance of the KROHNE mass flowmeter. Unlike other conventional mass flowmeters on the market, the OPTIMASS 6400 C can maintain operation when entrained gas is present in the tomato paste and – what is even more important – provides highly repeatable measurements for consistent food production.

Flow measurement of tomato paste with the OPTIMASS 6400 C

5. Product used

OPTIMASS 6400 C

- Coriolis mass flowmeter with a V-shaped twin bent flow tube for applications with liquids and gases in the food and beverage industry
- Entrained Gas Management EGM™: maintains operation over a wide range of gas fractions and complex flow conditions
- Optimised flow splitter for minimum pressure loss
- FDA, EC 1935/2004 conform; 3A, EHEDG certified
- HART®, FOUNDATION™ fieldbus, Profibus® PA/DP, Modbus, PROFINET, Bluetooth, etc.

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