KROHNE
measure the facts

Milk reception with entrained gas

- Reducing time and associated costs for unloading of aerated milk from road tankers
- Continuous and reliable flow measurement even in the event of 2-phase flow
- Unplanned shutdowns caused by equipment failure eliminated

Measurement requirements

A dairy industry receives fresh milk from local dairy farms daily. The milk is delivered from the farms to the dairy processing plant via large road tankers. Each tanker is unloaded at a flow rate of approx. 5 0 0 0 - 50,000 L/h and up to four tankers can be unloaded at the same time. During transportation foam is produced from the movement and vibration of the tankers. The foamy milk is then stored in a common buffer tank before being taken up for processing.

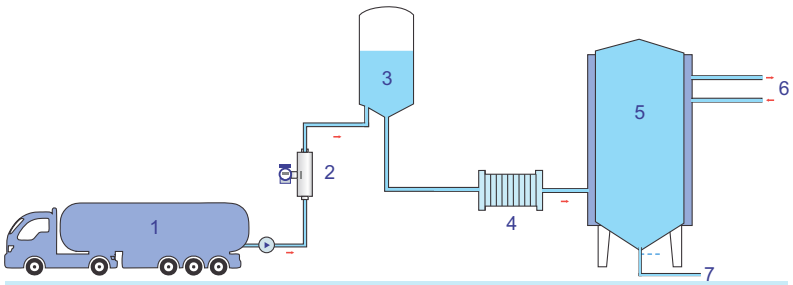
The plant was using coriolis mass flow meters to measure the milk quantities at the raw milk reception. However, the coriolis mass flow meters being used were unable to provide accurate results due to the gas entrained in the milk foam produced during transportation. Often the meters would revert to start up mode, i.e. completely stop measuring. Due to these interruptions, the unloading process would also get interrupted requiring manual intervention to restart. This in turn increased unloading time and reduced efficiency. Secondly, the lapse in measurement caused commercial disputes over the quantity of milk | delivered.

The process therefore called for a flow meter that could accurately measure the milk mass flow, even during phases where entrained gas is present.

The Ideal Solution – OPTIMASS 1400C

The OPTIMASS 1400C is a twin straight tube Coriolis mass flow meter from KROHNE. Unlike the conventional flow meters previously installed at the site, the OPTIMASS1400C has the ability to handle entrained gas in liquid flow, and is able to provide uninterrupted measurements.

A test installation at site provided continuous and uninterrupted measurement of volume flow and mass, density and temperature – even at difficult milk reception process conditions with 2-phase flow. Accurate readings even in the event of gas entrainment in the foamy raw milk established the reliability of the Entrained Gas Management (EGM™) feature of the OPTIMASS1400C.



1 Road tanker
2 OPTIMASS 1400C
3 Buffer tank
4 Filter
5 Cooled storage tank
6 Cooling
7 To separation and standardisation

Benefits

As the meter maintains operation over a wide range of gas volume fractions and complex flow conditions, loading process of milk is no longer disrupted in the event of entrained gas. The quantity measured is thus no longer disputed.

The OPTIMASS 1400C ensures not only highly accurate, continuous and repeatable measurements at the milk reception, but also help the plant to accurately calculate milk yield without measurement interruption as was the case with the previously installed Coriolis flow meters.

Based on the performance of the test installation, the OPTIMASS 1400C is now the default choice for this application.

Flow measurement at raw milk reception with the OPTIMASS 1400

OPTIMASS 1400 C

- Coriolis mass flowmeter with twin straight tube design for universal hygienic applications
- Mass, density and volume flow of gases and liquids; maintains operation even with entrained gas of up to 100%
- Available with various hygienic connections (clamps, SMS, DIN 11851, etc.)
- 3A and EHEDG certified; conforms to FDA and EC1935/2004 regulations

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