



APPLICATION NOTE Food & Beverage

Measuring the flow of liquid animal fat

- Loading hot liquid fat from animal remains
- Coriolis mass flow measurement of non-conductive medium with highly fluctuating density
- Accurate loading of tanks

1. Background

A waste management company specialises in using animal by-products such as bones, fat and rind. The company operates a treatment facility in which category 3 offal and slaughter by-products are processed into high-quality protein meal and fats used in pet food and agriculture.

2. Measurement requirements

For delivery purposes, the company needs accurate truck loading of its liquid animal fat products. The density of the hot fat can vary considerably during loading depending on the quality and composition of the animal by-products. The customer had previously been using a competitor's electromagnetic flowmeter to determine the load amount. Due to the very low conductivity of the medium, this instrument was, however, unable to guarantee a stable measurement.

Medium:	Liquid fat
Flow rate:	Up to 48 t/h
Density:	approx. 0.8 kg/l / 6.67 lb/gal (US)
Temperature:	+50...+100 °C / +122...+212°F

And as this measuring device primarily determined the load amount as a volume, it did not take into account the varying density of the fat. When converted to mass, this also resulted in measuring inaccuracies with regard to the actual quantity of fat loaded. The customer, therefore, decided to replace the electromagnetic measuring device with an instrument that could determine the mass more accurately and directly.

3. KROHNE solution

The customer opted for the OPTIMASS 1400 F. The Coriolis mass flowmeter was installed directly in the pipe (DN 50) at the loading point. The measuring instrument features a stainless steel twin measuring tube and was supplied with a remote converter for this application. In addition to mass flow, the OPTIMASS 1400 also calculates density and temperature as direct parameters.

KROHNE also provided a preselection counter at the customer's request. This is connected to the OPTIMASS 1400, allowing the exact load amount to be preset. As soon as the relevant amount of fat is reached, the flow is controlled accordingly or stopped via the preselection counter.



Converter (field housing) of OPTIMASS 1400 F above, preselection counter below

4. Customer benefits

Using the OPTIMASS 1400 allows the company to accurately determine the mass of the animal products when loading the trucks. The measuring device operates irrespective of the conductivity of the medium and takes into account the varying density directly. This means no more of the familiar measuring errors during the loading process. With the OPTIMASS 1400, the customer benefits from the most accurate measuring device in its price and performance category.

Thanks to the compact twin tube design of the OPTIMASS 1400, the measuring device was also easy to install without having to make costly changes to the existing infrastructure.

The customer also benefits from the measuring point being fully equipped by KROHNE. Besides the mass flowmeter, KROHNE also supplied a suitable preselection counter for accurate presetting and control of the load amounts.

5. Product used

OPTIMASS 1400 F

- Coriolis mass flowmeter for all standard applications
- With innovative twin measuring tube and an optimised flow divider for minimal pressure loss
- Cost-effective solution for accurate measurement of mass flow, density, volume, temperature, concentration and solid content
- With Entrained Gas Management (EGM™): stability with entrained gas of up to 100 percent
- DN15...100 / ½...4" and 48...170,000 kg/h / 1.76...6,235 lb/min
- Max. -40...+130°C / +266°F
- Best accuracy in its class
- Resistant to installation and process effects
- Easy to drain and easy to clean



Contact

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Do you require technical advice for your application?
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