



## APPLICATION REPORT Food & Beverage

### Mass flow measurement of spinach sauce



- Highly precise dosing of a seasoned sauce mixture to produce creamed spinach
- Measuring a viscous product with entrained gas and fluctuating density
- Consistent product quality and low production costs made possible by use of a mass flowmeter with a straight measuring tube

#### 1. Background

Iglo GmbH is Germany's and Europe's leading brand of frozen food, specialising in fish, vegetables and poultry. The company is known for its sustainable production methods and use of local produce. In its factory in Reken, Germany, Iglo produces frozen food using vegetables and herbs harvested by farmers in the direct vicinity of the facility. The most well-known product produced here is the spinach with the "blub". For this creamed spinach, the freshly harvested spinach is blanched, chopped and seasoned with a herb sauce mixture. Once the spinach is ready to serve it is frozen.

#### 2. Measurement requirements

Adding the seasoned sauce mixture requires a high degree of accuracy and stability to keep a consistent ratio of sauce to chopped spinach. Many quality factors (including flavour, consistency and look) as well as production costs depend on this.

The spinach sauce is a challenging product which, as expected, is difficult to measure accurately. It is a non-Newtonian, non-conductive, viscous liquid with a viscosity of  $>10,000$  mPas and sporadically occurring entrained gas. The customer had already been using mass flowmeters from different market competitors to measure the mass flow of the sauce even when the density fluctuated. Iglo's goal is to lower application-linked measurement errors in practice to well below  $\pm 2\%$ .

## 3. KROHNE solution

Iglo made the decision to test another Coriolis mass flowmeter, the OPTIMASS 7400 C. The high-performance device boasts a single straight tube design and EGM™ (Entrained Gas Management) functionality and is designed for demanding applications where gas bubbles may be an issue.

The test setup consisted of:

- 1 OPTIMASS 7400 with Titanium (DN 25) measuring tube,
- 1 test plate,
- 1 four-stage mono pump,
- 1 pressure-sustaining valve and
- 1 calibrated scale with a resolution of 100 gr (ca. 3.4 US fl.oz.).



Test installation with the OPTIMASS 7400 C

Once heated, the sauce was first pumped in a circuit to obtain a good mix and even consistency. Due to the low flow, KROHNE then calibrated the zero point of the OPTIMASS 7400 C in three test runs. This optimised efficiency so that the measuring device achieved an error of measurement of just  $\pm 0.6\%$  under operating conditions.

## 4. Customer benefits

The OPTIMASS 7400 C makes it possible to dose the spinach sauce much more accurately. Measuring accuracy is significantly higher, ensuring more constant product quality and lower production costs. In addition, pump output can be permanently reduced as there is much less pressure loss with the OPTIMASS 7400 C's large single straight tube. This further reduces costs. Compared to the measuring devices previously used, the KROHNE device featuring the EGM™ function enables better signal processing and guarantees considerably higher measurement stability in the case of entrained gas in the product.

Iglo was won over by the improvements and savings made possible. When it comes to the upcoming system expansion, the company is relying on the OPTIMASS 7400 C. The KROHNE mass flowmeter is designed both for sauce measurement and the subsequent measurement of the spinach/sauce mixture.

## 5. Product used

### OPTIMASS 7400 C

- Coriolis mass flowmeter with straight measuring tube
- For challenging applications with liquids and gases
- Measurement of mass, density, volume and concentration
- Entrained Gas Management (EGM™): Continuous measurement even at gas concentrations from 0...100% and sudden changes in gas content
- DN 10...100 / ½...4", all hygienic standard connections available
- EHEDG, 3A; FDA, EC 1935/2004
- On-site testing of converter electronics and sensor with OPTICHECK
- HART® 7, FOUNDATION™ fieldbus, PROFIBUS® PA and DP, Modbus



### Contact

Would you like further information about these or other applications?

Do you require technical advice for your application?

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