



## APPLICATION NOTE Food & Beverage

### Measurement of Brix and mass flow in sugar production

- Determining the weight and sugar concentration in sugar cane juice
- Measuring without pressure drop or blockage of the measuring tube
- Cost-effective alternative to weighbridges and laboratory analysis

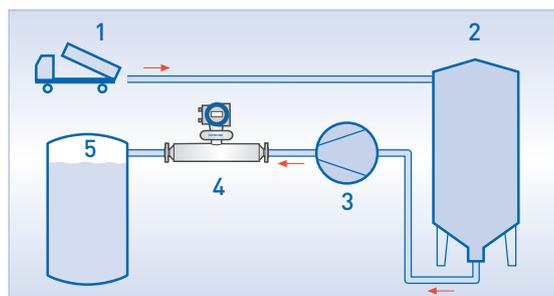
#### 1. Background

A sugar manufacturer produces sugar from sugar cane juice. After harvesting, the sugar cane is crushed in presses to obtain the sugar cane juice. This juice is then weighed before it is made ready for further processing. In the past, measuring the weight of juice was done by large weighbridges (truck scales), which was inaccurate and cumbersome. To determine the BRIX value (sugar concentration), juice samples had to be collected and analyzed in the laboratory, which was very time consuming.

#### 2. Measurement requirements

These methods resulted in significant investment and operating costs. The Brix values were also often late. Since Excise Duty is paid on the actual juice and not on the final product, eliminating uncertainties regarding the sugar concentration was important for the sugar producer. A decision was therefore reached to use a flowmeter to continuously determine the weight of the cane juice and the Brix values without delay. The meter was required to measure without risk of blockage and without requiring any maintenance.

Product:	Sugar cane juice
Mass flow rate:	250...350 t/h
Pressure:	5...8 bar / 73...116 psi
Density:	1060 kg/m <sup>3</sup> / 66 lb/ft <sup>3</sup>
Viscosity:	10 cP•s
Operating temperature:	40 °C / 104 °F



1 Delivery of the sugar cane; 2 Sugar cane press; 3 Stop valve; 4 BRIX and mass flow measurement; 5 Storage tanks

### 3. KROHNE solution

KROHNE supplied the Coriolis mass flowmeter OPTIMASS 7300 C. The meter was installed between the sugar cane press and the storage tanks. It measures the mass flow of the sugar cane juice as well as the sugar concentration (the Brix value) by way of integrated density measurement. The single straight tube design makes the OPTIMASS 7300 the meter of choice for measuring viscous liquids such as sugar without the risk of blockages or pressure loss.



The OPTIMASS 7300 C with integrated concentration measurement

### 4. Customer benefits

The OPTIMASS 73000 has enabled the sugar producer to reduce investment and operating costs in sugar processing significantly through the elimination of expensive weighbridge systems that require extensive maintenance. The Brix values can now be determined on-site and to the extent that the customer can almost entirely refrain from labor-intensive and costly laboratory analysis. The Brix values are provided to production immediately. Thus, the customer stands to gain from all the viable information to accurately determine the total sugar production of the plant resulting in more profit and savings in Excise Duty.

### 5. Product used

#### OPTIMASS 7300 C

- Coriolis mass flowmeter for the accurate measurement of mass and volume flow, density, temperature, concentration and liquids with solid content
- Single straight measuring tube without constrictions
- Choice of 4 different measuring tube materials
- Typical burst pressure of the outer housing above 100 bar
- Self draining and easy cleaning irrespective of process influences and installation
- Precision and excellent zero stability
- Low energy consumption saving operating costs
- Fast signal processing even with changes in process conditions
- Modular electronics design with dual redundancy and 'plug and play' electronics exchange possible



#### Contact

Would you like further information about these or other applications?  
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