



PROCESS INSTRUMENTATION

Coriolis installation at brewery indicates **a bright future for SITRANS FC440**

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The compact SITRANS FC440 Coriolis flowmeter demonstrated superior measurement capabilities and performance stability in calculating the sugar content of unfermented beer.

The customer

A global beverage company produces, markets, sells and distributes a variety of beverages including beer, malt, soft drinks, fruit juices and mineral water. The brewery has a leading presence in a number of markets throughout North America, the Caribbean, Africa and Europe.

The company posted millions in revenue with millions of gallons sold. The brewery, which currently employs approximately 2,200 people, has undergone significant expansion in recent years, including the addition of a fully automated multi-story warehouse with room for 18,500 pallets.

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The case at a glance

Industry: Food & Beverage

Challenge: Ensure consistent product quality through accurate measurement of sugar concentration in wort prior to fermentation

Product: SITRANS FC440

Main benefits:

- Real-time sugar content measurement
- Stable performance in dynamic flow and temperature conditions
- Digital signal reduces noise interference and enhances accuracy



Siemens SITRANS FC440 Coriolis flow meters.



The whirlpool, where solid materials are separated out from the wort prior to fermentation.

The challenge

Producing beer that demonstrates uniform taste, color and consistency is one of the biggest and most important challenges faced by any brewery. Although the brewing cycle generally only lasts for several weeks, it involves many steps that must be regulated through repeated measurements to ensure that the beer will adhere to a predetermined standard of quality.

Accurate measurement becomes especially critical after the wort (unfermented beer) is boiled in the brewkettle with hops and other additives, which causes some proteins to denature and coagulate. When the boil is complete, the wort is transferred at a high velocity to the whirlpool vessel, which forces much of the solid material to separate and settle into a cone shape at the center of the tank. Before the wort is moved from the whirlpool to the wort cooler to be prepared for fermentation, the concentration of sugar in the wort must be quantified to enable a calculation of the brewhouse yield.

The solution

The brewery has utilized several types of SITRANS F flow meters from Siemens to regulate all aspects of the brewing process for more than a decade, including SITRANS F C Coriolis meters to monitor the sugar concentration in wort prior to fermentation. The SITRANS F C meters measure the density and temperature of the flowing liquid and use a preprogrammed algorithm to calculate sugar content, which expresses the density of wort as the percentage of sugar by weight.

To perform the field test, a SITRANS FC440 was installed adjacent to the whirlpool to measure outbound wort. This location was considered ideal for testing the stability of the meter due to constantly fluctuating flow rates and temperatures. The existing Coriolis meters were left in place to serve as reference points. The meters were then subject to a rigorous series of assessments that were carried out multiple times over an 8-month period.

The results showed that the SITRANS FC440 met or exceeded expectations in nearly all areas of examination. Findings included:

- Performance remained stable at zero flow, with a deviation between Auto Zero setting results no greater than 0.2% over the course of 10 tests.
- Flow readings remained consistent over 4 consecutive days, demonstrating that the meters under test performs as reliably as the older meters in long-running scenarios.
- Mass and density readings were more accurate than the older meters under dynamic flow conditions, and comparably accurate under stable conditions.
- Temperature readings were comparably accurate to the older meters under both stable and dynamic temperature conditions. The beverage company is pleased with the results of the field test and believes that the Siemens Coriolis meters shows great potential due to its exceptional functionalities. According to the maintenance manager at the location, "The Siemens Coriolis meters provides density and temperature readings accurately, reliably and with good response times, which is exactly what our brewery needs. We absolutely feel confident in the new generation of Coriolis flow technology from Siemens."

Legal Manufacturer

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