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PROCESS INSTRUMENTATION

Coriolis installation at brewery indicates **a bright future for SITRANS FC330**

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The compact SITRANS FC330 Coriolis flowmeter demonstrated superior measurement capabilities and performance stability in calculating the °Plato 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.

In 2010, 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.

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 con-

The case at a glance

Region: Denmark

Industry: Food & Beverage

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

Product: SITRANS FC330

Main benefits:
- Real-time °Plato measurement
- Stable performance in dynamic flow and temperature conditions
- Most compact Coriolis solution on the market
- Digital signal reduces noise interference and enhances accuracy

The field test setup, consisting of two existing Siemens Coriolis meters and the new SITRANS FC330.

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

centration 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 flowmeters 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 °Plato, which expresses the density of wort as the percentage of sugar by weight. Because the brewery is highly satisfied with the products and customer support they have received from Siemens over the past 10 years, they agreed to participate in a field test conducted by Siemens for the next generation of Coriolis flowmeter: the SITRANS FC330. In addition to being the most compact flowmeter of its kind available on the market, the SITRANS FC330 is the first Coriolis meter from Siemens to utilize a digital signal for reduced noise interference.

To perform the field test, a SITRANS FC330 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 SITRANS FC330 was 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 FC330 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 SITRANS FC330 performs as reliably as the older meters in long-run ning scenarios.
- Mass and density readings were more accurate than the older meters under dynamic flow conditions, and comparably accu rate 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 SITRANS FC330 shows great potential due to its conveniently small size and exceptional functionalities. According to the maintenance manager at the location, “The SITRANS FC330 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.”

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