New Belgium Brewing refines calibration process

Self-calibrating thermometer saves 80 hours in calibration time

Company Profile

New Belgium Brewing Company, the maker of Fat Tire Belgian Style Ale, began in 1991 in Fort Collins, CO.

It built a new plant in Asheville, NC, in 2016. The LEED certified Asheville brewery is 133,000 square feet and has the capacity to produce up to a half-million barrels of beer per year.

New Belgium plans to invest $175 million in the new facility over the next seven years. Excluding construction jobs, Asheville plans to employ 154 workers.

Kyle Boughner - New Belgium Brewing Lead Instrumentation Specialist

New Belgium Brewing – Asheville, NC

Summary New Belgium Brewing needed an efficient solution to calibrate the brewery's RTD thermometers. With almost 100 RTD thermometers installed in the Asheville, North Carolina location, the manual calibration process had become time consuming, inefficient, and hazardous. Always looking at cutting-edge methods for improving product quality and operational excellence, New Belgium gave the green light to lead instrumentation specialist Kyle Boughner to explore alternatives. Kyle was challenged to find a safer and more efficient way to perform calibrations and Endress+Hauser's iTHERM TrustSens, self-calibrating thermometer proved up to the task.

The Challenge The brewery currently uses a combination of portable micro-baths and other RTD calibrators to perform calibrations on its RTD thermometers. The micro-bath calibrations involve the use of hot oil and an ITS-90 traceable reference thermometer. Each time the micro-bath is moved to a new location the oil must be heated to the appropriate temperature and allowed to stabilize prior to performing that actual single point calibration. Consequently, it takes New Belgium around 45 minutes on average to calibrate each thermometer. With close to 100 RTD thermometers in the facility, performing these calibrations becomes time consuming, taking up approximately 75-man hours per year. Performing calibrations using a portable micro-bath also creates safety concerns and challenges as transporting a micro-bath containing hot oil from sensor to sensor can become a serious safety hazard if not done properly and carefully.

"New Belgium's willingness to support innovation and modernization allowed me to test the Endress+Hauser iTHERM TrustSens in our process," said Boughner. *"After reviewing the product and white papers, I was anxious to give this RTD a try."*

Realization/Solution New Belgium and Boughner knew they needed a more efficient solution to calibrate the brewery's RTD thermometers as the current process was time consuming

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and hazardous. Boughner made the decision to purchase an Endress+Hauser's iTHERM TrustSens hygienic thermometer, the world's first self-calibrating thermometer to see if he could increase time savings and reduce risk and cost.

Solution details Typically, TrustSens is employed as a method of in-situ calibration for processes that undergo SIP [Sterilize In Place] on a regular basis. As steam is introduced to the process the temperature passes through the 118°C threshold that triggers the TrustSens calibration. Since New Belgium's processes do not employ SIP he has taken a different approach. He employs a simple portable ceramic block heater in conjunction with TrustSens unique technology to perform the single point calibration. Boughner removes the TrustSens temperature probe from the thermowell and places it in the ceramic block heater. Once the temperature at the RTD exceeds 118°C, TrustSens then begins to cool, it automatically initiates the calibration cycle. If the RTD is within New Belgium Brewery's self-defined accuracy tolerance, a green light appears. Boughner then reinstalls the probe into the thermowell and can proceed to the next RTD.

"The iTHERM TrustSens has the capability to turn a very tedious task into an easy and painless process," said Boughner. *"The efficiency gains from this RTD will help free up an enormous amount of time."*

Components iTHERM TrustSens - Endress+Hauser's iTHERM TrustSens thermometer maximizes product safety, plant availability and process efficiency. The TrustSens thermometer has a high precision reference built into the temperature sensor which aides in the calibration process. Its automated and fully traceable inline self-calibrations reduce process downtime helping to minimize risk and costs. Employing the TrustSens temperature transmitter with Heartbeat Technology™, calibration results are captured after every successful self-calibration. When technicians need the calibration history, they connect to the transmitter via a laptop, or download the data from the control system. Printable calibration certificates can also be produced via TrustSens' DTM in preparation for audits. The TrustSens thermometer eliminates the risk of undetected non-conformance issues without impacting existing validated procedures or GMP.

Installed iTHERM TrustSens sensor at the brewery

Results New Belgium tested the TrustSens thermometer side-by-side one of the facility's installed RTD thermometer for comparison and are extremely pleased with the results. Using the ceramic block heater, the calibration of the Endress+Hauser iTHERM TrustSens sensor takes no longer than 15 minutes, resulting in a 30-minute time savings per RTD. Using TrustSens as the new calibration solution also greatly reduces the risk to the brewery's technicians. Replacing the RTDs that are currently in the facility with TrustSens could potentially save 80+ hours in calibration time, considering some transmitters are calibrated once a year and other every six months.

"The iTHERM TrustSens is trending perfectly with our Endress+Hauser TM411's that we are comparing it to," said Boughner. *"We are not only happy with the ease of calibrations but also with the accuracy and response times we are seeing from this RTD."*

"I am always looking for ways to make life easier around the brewery, and I think everyone should think this way," Boughner added. *"I am fortunate to be working for a company that shares that vison and continuously tries to improve. Testing the iTHERM TrustSens is a perfect example of that."*

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