

Flowmeter boosts efficiency and quality at distillery

Promass Q undeterred by difficult conditions at North British Distillery



The North British Distillery Company was established in Edinburgh in 1885, making it one of Scotland's oldest and largest Scotch grain whisky producers. The distillation and maturation business sells grain spirit – the base for blended whisky – and its by-products. Significant quantities of North British grain whisky are included in many well-known blended brands. North British is now owned as a joint venture between Diageo plc and The Edrington Group.

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Project Engineer
North British Distillery



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The challenge When two of North British Distillery's density meters failed within a week of each other, the plant's engineers were looking for a modern replacement to measure the alcohol concentration of their product. Flow and density measurements are used to determine the alcohol by volume (ABV) percentage of the spirit, which in turn reveals the quality of the product and the efficiency of the process. But the distillery's accuracy requirements ($\pm 0.1\%$), need for reliability and the high temperature of the process had proved challenging for other instruments.

"The main problem we had with the old meters was that we had to calibrate them every shift because they kept on drifting," explains Brynjar Ólafsson, Project Engineer at North British Distillery. "If the temperature changed you had to adjust the meter, which happened regularly. I had looked at other meters, but they don't have the same turndown ratios, so if I'm getting very little flow out of a still, the meter doesn't like it; if it's disrupted, it doesn't like it; if you get solids in it, it

doesn't like it. So it wasn't going to be terribly reliable."

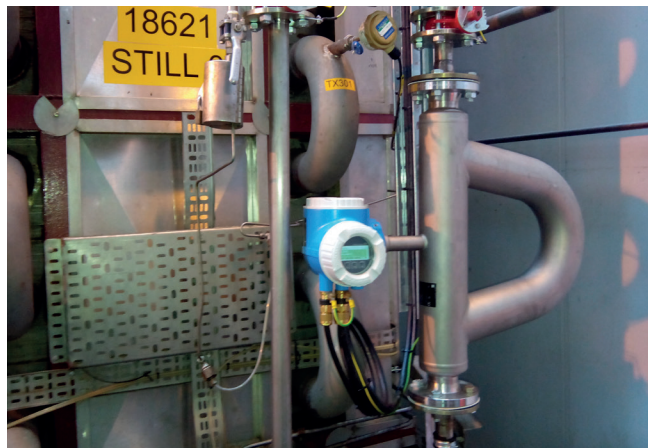
The solution Historically, highly accurate flow and density measurement was only achievable under ideal circumstances, meaning stable process conditions and homogeneous fluids. In the real world, however, these ideal conditions don't often exist. The Promass Q Coriolis flowmeter has been developed for such challenging applications in the food & beverage and oil & gas industries. Mass and volume flow, density and temperature can be measured with one single sensor. "It helps me that I can get all the measurements from one intelligent meter," confirms Brynjar Ólafsson. "We never had flow before, so we had to calculate how much spirit we were making by how much had gone in the vat. Now we have that information when we're running the still, and it gives the operator confidence in what he's doing."

Although the temperature of the process is higher than the standard alcohol density tables in the Promass

Q allow for, a trial determined that it could work within the process parameters. “Endress+Hauser did an awful lot of trial work even before they came and installed them, which meant they were more accurate than the old ones. We were hoping for $\pm 0.3\%$ and we got to $\pm 0.1\%$, which is quite nice,” says Brynjar Ólafsson. Due to the success of the trial, North British Distillery purchased a Promass Q for each of its four stills.

The benefits North British Distillery is now able to get an accurate reading directly off the stills, which are situated in an ATEX zone, and the Promass Q determines %ABV before feeding the measurements back to the company’s SCADA system. The highly accurate density and concentration measurement has improved product quality and efficiency, as Brynjar Ólafsson explains: “Now we know how much we’ve produced in spirit and how much we’ve produced in feints, which for us is off-spec spirit. You know which stills are performing, which ones aren’t, which ones you have to look at, where you’ve got a problem, where you don’t have a problem. It gives you clear information so you can manage your process better.”

The need for time-consuming daily calibration has also been removed. Promass Q is fitted with Heartbeat Technology, meaning the measurement can be verified without process interruption. “If it identifies an error, it comes up red,” says Brynjar Ólafsson. “So you just walk in the still hall and you know immediately it’s wrong – it’s quite nifty! Part of the reason I went with Endress+Hauser is they’re willing to do the services quickly, which is the main thing that we need: we need the stills running.”



Promass Q takes readings directly off the still in an ATEX zone



Accurate measurement improves product quality and efficiency

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