

Surface acoustic wave technology provides hygienic flow measurement for pharmaceutical manufacturer

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When active pharmaceutical ingredient (API) developer and manufacturer, Veranova, wanted to build a new manufacturing suite, it needed accurate control over volumetric flow to optimise process efficiency. As the suite would be installed within an existing area of the facility, the flowmeter had to contribute to a compact overall footprint. Handling various media, including solvents and acids as well as low conductivity liquids, the device also had to enable a clean in place (CIP) process. Veranova turned to Bürkert and its surface acoustic wave (SAW) technology to fulfil its requirements.

At Veranova's Edinburgh facility, the company planned a new manufacturing suite for high potency APIs, increasing production capacity from the lab to full-scale manufacturing. While Veranova has developed its own portfolio of APIs, the company is moving further into contract manufacturing, which will be supported by the additional capacity of the new production suite. To optimise manufacturing at a higher scale and ensure process efficiency, Veranova needed accurate control over the total flow of raw materials for API production, as well as the flow rate of chemicals in the CIP line.

Physical space is typically at a premium in API production, and Veranova's manufacturing suite had to fit within the footprint of its existing facility, so compact dimensions were even more important. This ruled out Coriolis meters, even though Veranova often uses them within its processes, because of their comparatively large size, as well as the extended pipework they need. Since the requirement was flow measurement rather than mass flow, an alternative solution would also be more cost effective.

The flow meter also had to be capable of measuring various fluids, including water-based solvents, and acids, that would flow down the same line following a flush. As some of the solvents involved have low conductivity, this would also rule out certain flow measurement technologies. Following detailed research and testing, Veranova determined that Bürkert's FLOWave flowmeter closely achieved its key requirements.

"FLOWave is really compact, and a key benefit is that it's hygienic and easy to clean, giving confidence that no residue is left behind. This enables us to use multiple fluids down the same line, and FLOWave can be calibrated specifically for each type of liquid, providing the accuracy we need," explains Richard Bell, Veranova. "It's a multi-purpose plant, and we can manufacture multiple products within the suite. Even within a single API product, multiple materials are used, and FLOWave will help us to achieve that."

FLOWave has a smooth bore that is completely free of mechanical obstructions, preventing retention of any residue from media or the CIP process, ensuring optimum hygiene. The device is also constructed from 316L stainless steel, which

compared to standard 316 has a lower carbon content, increasing its resistance to corrosion and improving hygiene. This was an important factor for Veranova that uses dilute acids within its process.

The device achieves hygienic flow measurement thanks to SAW technology, generating surface acoustic waves that travel through the fluid. Calculating time differences of the waves proportional to the flow, FLOWave can determine real time flow rates, total flow and flow velocity. The technique also enables FLOWave to measure irrespective of fluid conductivity.

While surface acoustic wave technology isn't new, some pharmaceutical manufacturers can be hesitant in deviating from the mainstream type of flowmeter, so why did Veranova make the selection?

"It was easily the best fit," says Richard. "We looked at various alternative brands and technologies, but none of them could achieve a compact design to hygienically measure the flow of multiple liquid types, including low conductivity media, as effectively as FLOWave."

With the suite now installed and commissioning almost complete, Richard says that set-up of FLOWave was simple and straightforward, and Veranova is looking to make the first batch from its new system very soon. The flowmeter also gives a flexibility to change production if needed.

"FLOWave has a wide flow range that can be easily adjusted depending on your application and media requirements. If we introduced a new API product, for example, we could easily re-range the device for a higher flow," says Richard.

Image captions:



Image 1: The FLOWave offers a very compact footprint, a key priority in this project



Image 2: Compact dimensions were very important for the new API production equipment



Image 3: FLOWave can be easily adjusted depending on the application and media requirements



Image 4: The FLOWave was simple and straightforward to install and commission

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About Bürkert

Bürkert Fluid Control Systems is one of the leading manufacturers of control and measuring systems for fluids and gases. The products have a wide variety of applications and are used by breweries and laboratories as well as in medical engineering and space technology. The company employs over 2,200 people and has a comprehensive network of branches in 35 countries world-wide.

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