

## Festo and QM Systems collaborate

to develop new automated mass testing system

**Industrial automation specialist Festo and systems integrator QM systems have collaborated on the evolution of a new automated laboratory system that fills, caps and labels test vials at speeds of up to 3000 vials per hour.**

The need for rapid and accurate mass testing was a key imperative during the COVID pandemic and the ability to automate the dosing process offers many opportunities in the post-pandemic world. Applications range from disease detection and medical diagnostics to cosmetics and biotech.

Festo and QM Systems have a longstanding trading partnership, but the increase in demand for automation in life sciences and lifetech within the last few years has prompted even closer collaboration. Russell Lotinga, Festo Business Development Manager, explains: “We were approached by a customer who had a clear and immediate requirement for a high throughput filling system, but Festo are not machine builders. We took the challenge to QM Systems because they specialise in the development of automated systems, tailored to suit customers’ requirements. Combined with our expertise regarding the automation components required to achieve the complex filling and handling requirements, we were able to develop an optimum solution for this customer.”

### Repeatability at speed

The original challenge was to develop a machine for respiratory testing that could automatically fill vials to different levels accurately, repeatedly and at speed, while also ensuring traceability back to individual patients.

QM Systems designed a high-speed vial filling, capping and labelling line based on Siemens control. The system uses two bowl feeders – one for the vials, one for caps – to introduce the parts into the machine. The Festo handling system lifts each vial out and lines it up vertically before presenting it to the dosing head for the liquid to be added. A cap is then applied, using torque monitoring to ensure the lid is fitted correctly. The filled and sealed vial is then oriented horizontally and presented via a pocket conveyor for labelling. A serially coded label ensures each vial can be linked to a specific patient.

Kristian Richardson, Commercial Director of QM Systems says: “The challenge with this project was the fine tolerances, tight accuracies, variable dispense volumes and high throughputs. To achieve a robust solution the commissioning phase was critical but designing in adaptability

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was the key to allow us tweaking positions during setup. Festo's comprehensive range of automation components, combined with their considerable expertise in specifying complex handling systems, enabled us to develop the best solution."

### **Precision automation**

For optimum accuracy, the automated filling line incorporates Festo's VTOE dispensing head and VAEM valve control module. With eight dispensing needles, the VTOE enables precision dispensing of various liquids and filling volumes. Very specific dosing quantities can be achieved thanks to the flexible and reproducible pressure and opening times. The VAEM valve control module makes precise switching of the solenoid valves simple and allows up to eight channels to be parameterised individually. A time resolution of only 0.2 ms and control of the valves via current – not voltage – ensure high precision.

Capping tolerances are controlled by Festo's EHMD rotary gripping module. Its unique Z compensating module automatically adjusts to the thread pitches of the vials. Various other Festo servo drives and controllers, coupled with pneumatic actuators, facilitate the correct orientation of the vials during dosing and then rotate them horizontally to allow individual labels to be applied.

### **Major step forward**

The new automated dosing system can deliver variable fill volumes from less than 10 microlitres to bulk dispensing of much higher volumes. It processes an impressive 3000 vials per hour and achieves a repeatability of +/- 0.5% with a fill volume of 50 µl to 1500µl.

In conclusion, Kristian Richardson says: "This particular automated system was designed to handle one vial and one lid, with variable dosing levels. However, the automation principles involved can be readily expanded and adapted to meet other customer requirements. It offers big advantages of improved speed and accuracy over previous handling systems and can be equally applied to bloods and other bodily fluids, as well as non-medical liquids dosing and testing."

### **Press Images**



#### **QM Systems 1**

The automated filling line incorporates Festo's VTOE dispensing heads and VAEM high speed valve control module.



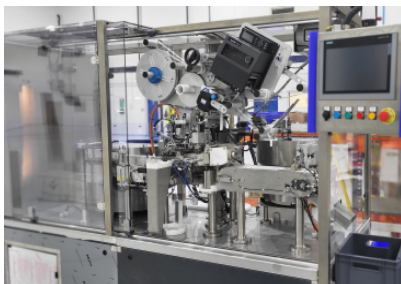
#### **QM Systems 2**

The cap fitting process picks and applies each cap to a specific torque using the Festo EHMD.



#### **QM Systems 3**

A label is printed and applied, giving batch code traceability.



#### **QM Systems 4**

The high-speed vial filling, capping and labelling line designed by QM Systems.

### **Festo GB & IE**

#### **About Festo**

Festo is a leading international supplier of automation technology with a turnover in 2024 of around €3.45 billion. Festo employs over 20,000 people worldwide and is a proven innovator and problem solver in pneumatic and electrical automation, where it is the performance leader. Festo offers around 36,000 pneumatic and electric products in hundreds of thousands

of variants for factory and process automation technology, many of which can be tailored to specific customer needs. Sustainability, reducing its CO<sub>2</sub> footprint, digital learning, innovation, performance and speed are the key drivers for the company's future. Festo GB operates as a carbon neutral organisation and uses the PAS 2060 standard externally audited by NQA to validate this claim to customers, employees and other stakeholders.

**Festo Industrial Automation's** innovative strength is demonstrated through the launch of around 100 new products every year. The company invests over 8.5% of its turnover in R&D, resulting in over 2,600 patents held worldwide. For more information about the company's products and UK / Irish services, please visit: [www.festo.com/gb](http://www.festo.com/gb) and [www.festo.com/ie](http://www.festo.com/ie)

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**Festo Bionic Learning Network** encapsulates the innovative nature of Festo, raising awareness and attracting talent to the company. Exploring the links between nature and technology opens new areas of innovation and demonstrates complex ideas in a stimulating and enjoyable way. Festo works with an alliance of internal R&D, external educational establishments and specialist companies to advance bionic solutions for automation applications of the future. The objective is to benefit from bionics as a source of inspiration and to realise these in industrial automation. For more information about Festo's Bionic Learning Network, please visit: [www.festo.com/bionics](http://www.festo.com/bionics)