

30 Years of Partnership in Lateral Flow Testing

Rapid diagnostic testing plays a vital role in healthcare, food safety, and veterinary applications, where timely results guide critical decisions. Lateral flow assays are widely adopted in all of these sectors for their ability to deliver accurate results without the need for complex instrumentation, making them especially valuable in resource-limited settings. Spanish manufacturer Operon has been at the forefront of lateral flow test development for more than 30 years and now relies on BioDot's cutting, dispensing, and web handling systems to ensure the consistency of its products.

Operon is a family-owned company founded in 1973 and based in Zaragoza, Spain. Known for its pioneering role in lateral flow testing, it has grown into one of Europe's leading development and manufacturing facilities in the field. Its expertise spans early pregnancy tests through to advanced assays for detecting gluten in food, with highly specialized solutions serving the human health, veterinary, and food sectors.

In the early years, Operon faced several challenges in developing its lateral flow tests. Membranes were highly inconsistent, the materials used in test strips were fragile and required precise handling, and the ability to dispense accurately at such a small scale demanded specialist expertise. Even minor inconsistencies could compromise test performance; reactions between molecules needed to be tightly controlled, porous membranes had to be cut with precision, and any damage to nitrocellulose could disrupt fluid flow and cause variability. Handling was equally critical, as misalignment or small gaps could break the continuous flow path essential for test function. Recognizing the need for greater engineering precision, Operon sought external expertise from BioDot in the 1990s and the long-standing and successful collaboration between the two companies continues to this day.

Operon uses BioDot equipment in both its R&D and production workflows. In small-scale projects, BioDot's XYZ™ dispensers precisely deposit tiny reagent volumes before assembly, after which BioDot cutters slice the lateral flow membranes into test strips. At the production scale, Operon uses two large reel-to-reel dispensers from BioDot, which apply reagent lines to long rolls of material that are then rewound for downstream processing. A key strength of these systems is the precise transition between pumps; when one pump closes and another opens, the minimal gap ensures smooth, continuous dispensing across the full length of each roll. As **Vincente Corbatón, technical director at Operon**, explained: "When you work with a reel-based system, the materials come in rolls of around 100 meters





long, with a single roll producing roughly 22,000 test strips. You have to make sure that every one of those tests is exactly the same. The materials themselves can vary because they're porous, which is something you cannot completely control, but you can at least make sure that the dispensing is as precise as possible. That's why BioDot is our preferred supplier for both R&D and production instruments; its equipment offers the precision and tolerances we need, and performance has remained consistently reliable as manufacturing processes have evolved."

Operon's ingenuity was put to the test in 2011 when a multinational corporation asked for help to tackle a widespread milk fraud issue in Brazil that had been going on since 2007. Some suppliers were mixing whey – a byproduct of cheese making – into fresh milk to increase volume and profit. Although a detection method existed, it was slow and required complex instrumentation, prompting the search for a faster, simpler testing solution. In collaboration with a European university – and using BioDot equipment – Operon was able to develop a highly effective rapid test capable of detecting whey adulteration in milk. The project was completed in just two years, and the resulting test proved so effective that, soon after it was introduced, the fraudulent practice quickly declined. As **Tomás Toribio, managing director at**

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Operon, explained: “It was a very successful project, and there was huge demand for our tests, which we were able to meet rapidly thanks to our BioDot systems.”

Beyond the lab, Operon and BioDot have also jointly hosted numerous workshops at Operon's Zaragoza manufacturing base. These events have introduced participants to the BioDot technologies that support Operon's production processes, and have given attendees a firsthand look at how lateral flow tests are developed and manufactured. Experiencing the equipment in use has helped researchers and start-ups to accelerate their own R&D, and some have later adopted the same BioDot systems within their own facilities.

“BioDot was our first partner, and our relationship remains very close today,” said Tomás. In the early days, we had to build our own equipment but it was designed by scientists rather than engineers and, while it did the job, it lacked the precision and refinement of modern systems. When BioDot entered the market, we recognized the value of the precision it offered and we have continued working with them ever since. More than 30 years later, we've produced millions of tests and still rely on BioDot as our preferred equipment supplier.”

To discover more about Operon, go to www.operondx.com

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