

FLEXING AUTOMATION CAPABILITIES.

Tecan Journal Article.



Many diagnostic laboratories rely on PCR-based tests to identify a range of illnesses, from gastrointestinal and respiratory infections to tropical diseases. However, processing the samples manually can be time consuming and prone to errors, limiting the number of tests that can be carried out in a day. Automation can increase throughput, but is not always practical for smaller laboratories that do not need to run hundreds or thousands of samples at a time looking for the same pathogen. Certest Biotec – a Spanish biotechnology company – has developed the VIASURE V-Flex, an automated and flexible workstation for nucleic acid extraction and PCR set-up, that can be used to run multiple different PCR reactions on a single plate.

Certest was established in Zaragoza, Spain, in 2002, to develop and manufacture in vitro diagnostic products for the detection of viruses, bacteria and parasites. The company's growth is based on the research and development of new products, and the exploration of new market niches and opportunities. Historically, it has developed and sold real-time (RT)-PCR kits under the VIASURE brand name but, during the SARS-CoV-2 pandemic, the company identified a need for flexible automation workstations that could run their kits at high workflow volumes, and the

V-Flex was conceived. Dr Cristina Escolar, Product Specialist Manager for Molecular Diagnostics, explained: "The V-Flex system was designed during the pandemic to provide a solution to diagnostic laboratories with high workflow volumes, an easy-to-use and quick tool that would automate the VIASURE reagents and allow processing of different clinical samples for subsequent analysis by RT-PCR."

Cristina continued: "As a biotechnology company, we had never worked in the field of engineering before. We routinely used liquid handling

workstations from Tecan during the manufacture of our RT-PCR kits, but we had no idea how complex such systems could be to design and build. Our experience of using the equipment daily naturally led us to approach Tecan for help with the development of our own system. We had clear ideas that we wanted to create a solution that could process a large volume of samples and simultaneously minimize the workload of the technicians in a laboratory. However, when we began to put these initial theories into practice, it became obvious that there were many things that we hadn't considered, and this is where the Tecan team came in."

Cristina described: "Our system is based on the Cavro® Magni Flex, and we first had to work with Tecan to customize a basic worktable and decide which modules our users would need on there. They would be working with clinical samples in a 96-well format, as well as different types of tubes and labware that might be necessary, and all of this was incorporated into the design. The system has eight channels that can move independently and this allows the level of flexibility and throughput that we wanted to achieve. We also incorporated a gripper arm, so that the equipment can not only pipette liquid, but it can also take a plate and move it to where it is needed. The rest of the worktable has been configured according to the different steps of the extraction process; we added a ThermoShaker for heating and agitating samples, and another position for sample separation using magnetic beads. There is also a cooler unit to store the final nucleic acid for up to eight hours, in case the technicians are not in the lab when the process finishes. There is even a station for tips of different sizes – given the broad



VIASURE
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For more information about the VIASURE V-Flex from Certest, visit <https://www.certest.es/viasure/v-flex/>

pipetting range we need to use for the different reagents – so that everything is contained within the worktable, which is very important to maintain a sterile environment and when working with potentially infectious clinical samples.”

“The instrument also incorporates the Tecan MAPlinx™ Software, which provides an easy, automated and clear process to qualify the instrument after it has been installed,” Christina added. “In addition, MAPlinx gives field service engineers the ability to troubleshoot any hardware issues, as well as managing instrument integrity after a service. This software means that the platform is easy to set up and maintain, and complements the carefully thought out instrument design.”

“Using the Cavro Magni Flex as the basis for the V-Flex means it has all the technological benefits provided by the Tecan platform, such as handling small volumes and pipetting precision. One of its main advantages for the end user, however, is its flexibility to process various sample types without having fixed numbers, and even allowing the running of different diagnostic kits on the same processing plate. For example, if 10 sputum samples



that need testing for a respiratory virus arrive at the same time as 10 fecal samples that need testing for gastrointestinal infection, they can all be run at the same time, and nobody has to wait longer for their results.”

“This was a huge project and working with Tecan was very collaborative. We have learned a lot from the process, and this is helping us to think about new ideas. We are now working on a second version of the platform that will offer even more adaptability, and we are focusing on finding ways to reduce the wastage of reagents for laboratories

that do not need to run full 96-well plates at a time, which will solve a big problem for smaller departments. The design and development of the V-Flex platform has been a bit like trying to build an airplane while it’s flying. But, thanks to the work carried out by the Certest team, and the collaboration with Tecan, we have been able to create an instrument that is suited to the needs of diagnostic laboratories whatever their workload. We are looking forward to working with Tecan to develop the system even further and provide an enhanced solution for our customers.” Cristina concluded.



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