

Cartridges for rapid PCR tests

Joining plastic parts tightly, quickly, and cost-effectively with ultrasonics

PLASTIC WELDING

METAL WELDING

CUTTING

CLEANING

SIEVING



01

Bronschhofen (CH), 02/2022

PCR tests are the right choice for detecting infectious viruses such as SARS-CoV-2. Nowadays, anyone can quickly get the results. Qiagen, for example, has developed the compact QIAstat-Dx analyzer, which, in combination with the appropriate test cartridges, enables real-time PCR to quickly detect pathogen nucleic acids in human biological samples. As a result, over 20 pathogens, including Covid-19, can be detected in a single run in just 60 minutes. The small test cartridges (Fig. 1) contain all the necessary laboratory equipment in miniature format with all solid and liquid reagents. At the same time, they are simple to handle: The sample is taken from the patient and inserted into the cartridge. Only a few steps are required to insert them into the analyzer. After only one minute, the test can start. To ensure that the liquids required for this do not leak, the cartridges must be absolutely leak-proof and, as a medical product, meet high quality requirements. At the same time, production costs should remain as low as possible since each cartridge can only be used once. For Qiagen, ultrasonic welding systems are therefore the method of choice for joining plastic parts inside the cartridge.

Large quantities with consistent quality

Today, ultrasonic welding is considered the fastest and, at the same time, the most cost-effective and reliable method of joining and assembling plastic parts. A major advantage is the lack of adhesives, connection elements, or solvents it uses, making it also a highly eco-friendly and efficient process. Two ultrasonic welding systems from Telsonic are now in operation (Fig. 2) at the Barcelona site, where Qiagen manufactures the test cartridges. One of these was already in use before the pandemic; the second was added now due to increased demand. Both are housed in sound enclosures (Fig. 3) that provide effective shielding for employees. Today, up to 2,000 cylindrical plastic parts are fastened inside the test cartridges with secure and absolutely tight weld seams every day.



02



03

- 01 Qiagen test cartridge QIAstat-Dx (© by Qiagen)
- 02 Ultrasonic welding system USP750
- 03 Sound enclosure

The robust and durable type USP750 ultrasonic welding systems have already proven themselves many times in large-scale productions, e.g. not only in medical technology, but also in the automotive industry. They demand low maintenance, high reliability and long service life. Thanks to their high level of conversion flexibility, the systems are also ideally suited to applications with small quantities. In addition, continuous process control can be easily implemented. The welding results are monitored in quality windows and automatically evaluated graphically and statistically. This guarantees that the test cartridges for the fast PCR analyzer can be manufactured in large quantities with consistent quality.



04 Jochen Branscheid,
Sales Manager for Italy
and Spain at TELSONIC
AG, Switzerland

by Jochen Branscheid, Sales Manager for Italy and Spain at Telsonic AG and Ellen-Christine Reiff,
Redaktionsbüro Stutensee