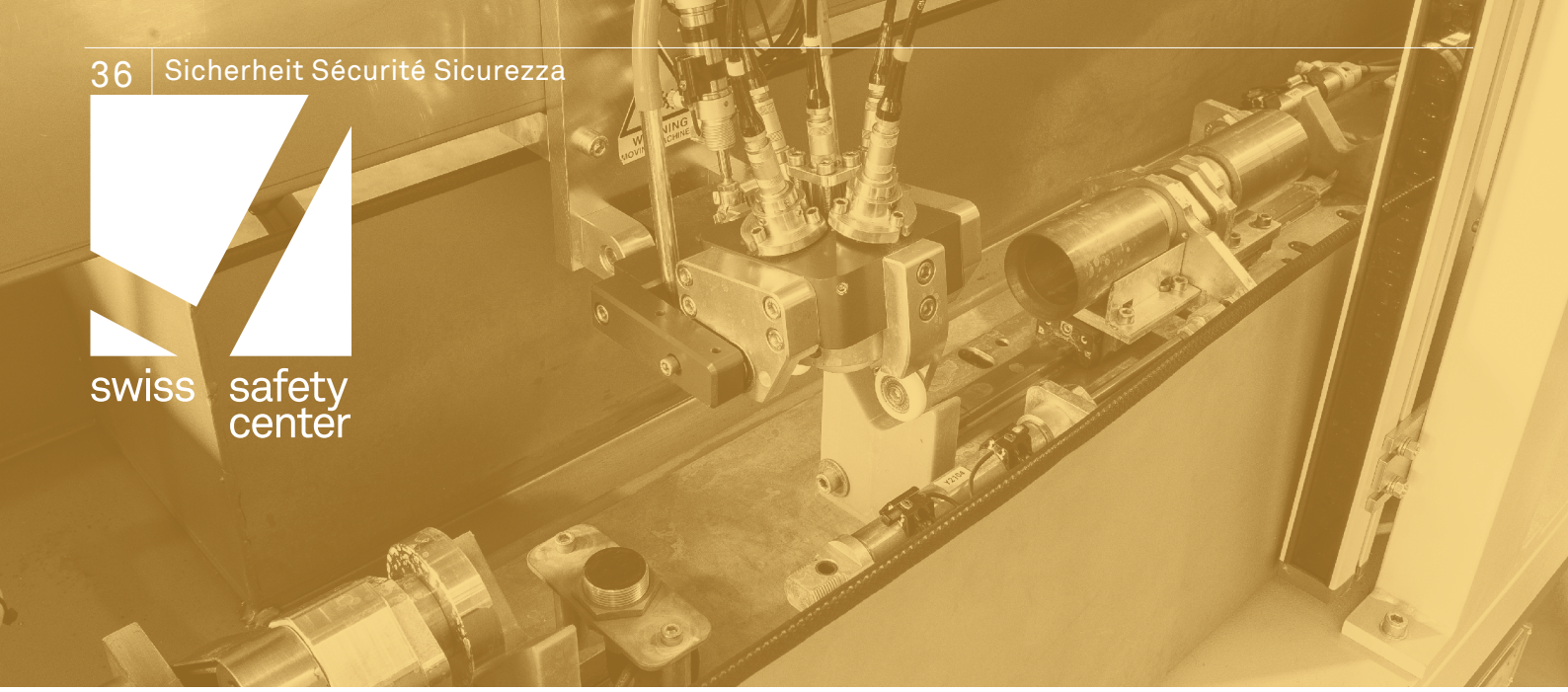
swiss safety center



EDITORIAL

Dear Readers,

In line with our vision 'Swiss Safety Center – for a safe future', digitalisation is the focus of all our areas of activity. With fire protection simulation, this was introduced long ago and has since opened up new possibilities in the design of buildings. We are also expanding our range of services in the field of automation. You can find out more about these innovations in this issue. We will explain to you how a large number of gas cylinders for water carbonators can be tested fully automatically using the new 'AutosonicTM mini+ Auto' ultrasonic testing plant. This shows that automation also plays a key role when it comes to safety. After all, monotonous work does not need to be carried out by human hands. Automated control processes are able to better ensure that the required quality is maintained and defective products are rejected.

I wish you a wonderful Advent period as well as a successful, safe 2021 and good health.

Dr. Raffael Schubiger
CEO
Swiss Safety Center

ARTICLE PRINCIPAL

Autosonic™ mini+ Auto – the fully automatic ultrasonic testing plant for gas cylinders

At a time when terms such as IoT, artificial intelligence and smart manufacturing are ever-present, it is important to have automated systems that can gather and analyse the data generated during production and use it to create added value. The newest member of the Autosonic range, Autosonic™ mini+ Auto, is completely data-based and thus fits perfectly with this philosophy.

Automation has become something completely different to what it was a few years ago. The various technologies are increasingly interlinked and the resulting systems, often referred to as ecosystems, are becoming progressively larger and often more complex. Process automation does not just mean the systematic repetition of mechanical processes. These processes are increasingly being supplemented with data from other sources to improve the efficiency and performance of the automated processes. Automated machines can therefore be optimised not just through the use of expensive high-performance components but also by using production data correctly. This is exactly what we guarantee with our Autosonic™ mini+ Auto system, which carries out both an automatic quality check and the certification.

Testing with additional benefits

The system was developed to check gas cylinders. By law, these must be checked regularly to ensure compliance with their physical functional requirements. Non-destructive testing methods are an effective option for conformity testing. As a result, AutosonicTM mini+ Auto delivers a range of tested gas cylinders while creating a digital certificate for each tested cylinder, thus guaranteeing the traceability of all data and providing information about the performed tests. The corresponding data is stored in the form of images, graphics, digital signals and numerical data from the sensors integrated at various points in the test system.

The heart of the Autosonic™ mini+ Auto is no different from the other products in the Autosonic™ range. It consists of an automatic ultrasonic test probe for longitudinal and transverse defect testing as well as for the detection of any wall weakening. All automation and important data processes have been developed around this ultrasonic module. Three automatic camera modules equipped with laser profilometers read the information engraved on the cylinder shoulder at three different points in the system. When entering the plant, the entire data set is recorded (approx. 150 characters), but only the relevant data such as the production date and the serial number are saved and allocated to the bottle. When leaving the plant, the data is compa-

red again, with a particular focus on the new conformity seal that is applied when all the necessary tests have been passed successfully. A third station located directly after the ultrasonic test automatically determines the correct position for the new label. The automated process includes a robot island with a camera system that controls entry into the plant and pallets the gas cylinders after the test, as well as a handling system with 35 mini pallets (one for each bottle) that move through a conveyor belt and are continuously monitored by RFID sensors. The remaining components consist of a weighing station, a hydraulic head for applying the new conformity stamp, a water return and recycling system and a drying station.

Complete, user-friendly solution

All stations are replicable modules that can be easily integrated into different arrangements and used for various types of gas cylinders as the independent modules are controlled by their own software. This software in particular plays a fundamental role in dealing with confidential data. Industrial image processing systems use neural networks to read and analyse the data printed on the cylinder shoulder. With the aid of 3D algorithms, the robot locates the individual cylinder on the pallet while the ultrasonic test is controlled by an ad-hoc software called Autosoft that has been developed over the years. All the data generated by the individual modules is then combined and managed by an additional software unit (the supervisor) that structures and saves it. This is done, for example, in a simple relational database on site or in a data lake in the cloud.

The ability to develop and programme software, the background knowledge of IT systems, the mission to research and utilise new technologies, and a wide future-oriented focus are fundamental elements of our complete solutions. In general, the philosophy that guides our automation efforts is developing and designing simple and user-friendly solutions to complex problems and combining them with the latest NDT technologies in a fully automated process with a digital platform. This platform records and saves all the data necessary for a sound and effective result as well as for extensive analyses and predictive or corrective measures, and makes it available for different user levels.

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