

# Driving glass inspection innovations at HEYE through digitalisation



As embodied within HEYE's SmartLine 2 inspection machine, the digitalisation of container inspection continues to advance - all bringing increased speed and accuracy to glass manufacture, as well as greater efficiency.

Innovation in glass manufacture is typically driven by pressure brought to bear upon the businesses of customers. Here the development of new inspection equipment at Heye responds to these exact market demands, which are dominated by two current trends, namely premiumisation and the ongoing journey towards net zero emissions.

Yet as brand owners seek further differentiation through packaging design, both premiumisation and customisation have rendered inspection challenging, with glass manufacturers under fresh pressure to meet today's demand for more non-round, complex shapes, as well as more mini-ware (as sampling and tasting become ever more important in pushing new boundaries within the drinks industry). That said, such special operations as mini-ware and non-round containers are all standard in Heye's SmartLine 2.

The packaging industry is also called upon to meet the added need to restrict emissions throughout the entire supply chain. Now, with a view to facing such chal-

lenges head-on, Heye updates its inspection technology constantly, given that increasing inspection efficiency reduces both false positive ejection and energy consumption. This keeps costs down for customers as developments see digitalisation and AI as significant twin contributors.

Automated production driven by smart technology makes machine-powered processes more efficient - ultimately reducing raw material use, energy consumption and CO2 emissions. Indeed, Heye makes extensive use of AI in new software that trains machines to read and react to different faults whilst correctly identifying any design features within the new container that might previously have been erroneously perceived as faults. All this is explicitly demonstrated by the new AI-enabled Mould Number Reader KSL3.

**A COMPREHENSIVE SUITE OF HI-TECH INSPECTION TOOLS**

At the heart of Heye's operation is the HiSHIELD

SmartLine 2, which integrates state-of-the-art technology with robust electrics, coupled with an electronic control system. Working at speeds that can reach 400 articles per minute, up to six inspection stations are configurable from an extensive menu to meet user requirements.

The application of servo technology results in a high degree of flexibility. Fast and easy changes to an item's indexing positions and optimal use of the servo torque for up to four rotation stations are both possible. Optimized motion sequences allow for faster reactions to changing process parameters. Besides, the equipment's innovative design and large, easy-to-open hood all afford more space for working between the inspection stations while job changes, too, are rendered much easier.

The most up-to-date SmartLine 2 also features extensive, non-contact enhancements which include bore gauge, diameter and ovality inspection as well as wall thickness. A major advantage here is that Heye employs the superior chromatic-confocal method, which offers far greater precision in comparison to other solutions. These non-contact features are available for retrofitting onto original SmartLine 2 machines.

During glass container production, check-detection is among the most important quality inspections, which is capably performed by the HiSHIELD Ranger 2 when eliminating critical defects

to ensure that manufacturers ably fulfill the quality expectations of their customers. Indeed, respecting all critical defects, it has repeatedly shown itself capable of detecting more than 99.8 percent. Now, Ranger 2 can inspect pharmaceutical mini-ware as well - an evolution that affords this system its capabilities to fulfill all customer requirements respecting container size and shape.

**LATEST AI-INSPIRED DEVELOPMENTS**

A latest addition to the glass manufacturer's arsenal of inspection technology is Heye's new Mould Number Reader KSL 3 - an innovation that stands at the forefront of digital, non-contact inspection thanks to its use of AI (machine learning) to self-improve its performance while in operation.

In two steps, this serves the following aims:

- Step One, the systematic ejection of ware from faulty moulds at the cold end by way of scanning mould numbers - even where they are not especially well-defined.
- Step Two, correlation of detected defects to repeating mould numbers followed by their communication to the Hot End.

Sometimes older mould number readers struggle to recognise poorly-defined numbers, which are typically caused by faulty or worn embossing within the

moulds. Instead, KSL 3 features a new evaluation algorithm that's based upon artificial intelligence, which enables it to train itself to learn shape number deviations. These technologies facilitate a swifter system set up such that previously illegible mould numbers can now be read.

The result is that the KSL 3 increases correct mould number reading rate to over 99 percent. It also improves the equipment's ability to recognise those standard digital mould and alpha numeric codes that are available on the market.

The simplified and intuitive Graphical User Interface (GUI) hastens identification, thereby enabling more effective record keeping.

This data feeds all aspects of the production process. PlantPilot Information Management con-

nects Cold End and Hot End whilst enabling sifter rectification of identified problems within individual mould sections. The system pools and aggregates data from different sources, then shares this information on the spot. Tracking and tracing, together with the possibility of creating user-specific analysis, are all additional components that allow continuous improvement processes to increase productivity.

On SmartLine 2 we constantly reduce mechanical elements and enhance non-contact, digitised components of the inspection system. Powered by Industry 4.0, the new mould number reader augments HiSHIELD's suite of digital and non-contact inspection equipment to create a cutting-edge Cold End system that removes defective articles. ■



smart plant



ABOUT HEYE INTERNATIONAL GMBH

Based at Obernkirchen, Germany, Heye International GmbH is one of the international glass container industry's foremost suppliers of production technology, high performance equipment and production know-how. Its mechanical engineering has set industry standards for more than five decades. Extensive industry expertise combined with the positive attitude and enthusiasm of Heye International employees is all mirrored by the company motto 'We are Glass People'. The company's three sub-brands HiPERFORM, HiSHIELD and HiTRUST jointly form the Heye Smart Plant portfolio - respectively addressing the glass industry's hot end, cold end and service requirements.

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