MiniLab statistical sampling system.

Closing loops and building bridges

Philippe Spiteri explores the benefits of early defect detection, paired with an information bridge between hot end and cold end.

In today's global market, most glass container manufacturers face the ambitious challenge of improving productivity while reducing production costs at ever increasing quality levels imposed by their customers.

Emhart Glass offers several inspection products, specifically designed to help glassmakers achieve and maintain a high level of productivity while improving quality, namely the ProLab, FleXinspect and MiniLab. This equipment allows bridging hot end and cold end by taking advantage of hot end early detection, cold end inspection and automated statistical sampling.

Experience shows that a loss of about 4% is typical at the hot end from ware handling (0.5%), swabbing (2.5%) and downtime losses attributable to job change and equipment maintenance (1%). Assuming a typical cold end defect loss of 5%, this adds up to 9% loss opportunity for revenue. The challenge of reducing this loss is of course intensified by the time it takes for defect information to be fed back to the bottlemaker for corrective action.

Emhart Glass believes that building on early defect detection and trend analysis associated with an information bridge between hot end and cold end to correct problems before the process gets out of specification is essential to increased pack rate and improved product quality.

FleXinspect T total inspection solution.

HOT END DIMENSIONS MEASUREMENT

ProLab is the latest addition to the Emhart Glass portfolio of quality control equipment. It provides fast, accurate, semi-automated measurements for a wide range of glass containers at the hot end. The ProLab is specifically designed to measure dimensions of the container including lean, internal bore and glass thickness, information traditionally coming from the cold end.

Providing semi-automated container measurement at the hot end is a major breakthrough for increasing productivity and keeping the glassmaking process under control. ProLab provides valuable product quality information, where the bottlemaker can take immediate action, thus significantly reducing response times to anomalies.

COLD END INSPECTION

The FleXinspect family of cold end on-line inspection equipment is loaded with novel technology, offering a level of inspection and flexibility unmatched by others in the industry.

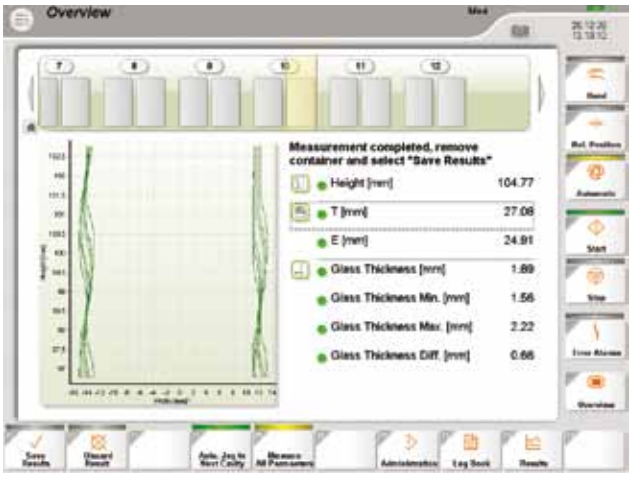
FleXinspect T can be configured as a simple check inspection machine to a complete inspection solution including glass thickness, vision plug/dip/ring, base, finish and sidewall inspections.

FleXinspect BC is a multi-function, combined vision inspection system, capable of delivering up to 24 images of each container for base, finish, sidewall and dimensional inspections.

When installed together, the FleXinspect machines provide a fully redundant inspection solution, providing constant feedback of product quality. The FleXinspects offer the ability to display mould-correlated inspection information and images of defective containers at the hot end, thereby, giving the bottlemaker continuous information to improve the production process.

STATISTICAL SAMPLING SOLUTION

MiniLab performs automatic measurement of weight, dimensions, pressure, capacity and glass thickness of containers. When attached to an on-line inspection machine like FleXinspect T or FleXinspect BC, the MiniLab offers a fully automated statistical sampling solution, with containers automatically diverted from the manufacturing line and measured. The equipment eliminates the need for cumbersome and time-consuming manual quality control tests with fixed



Graphical display of a container finish with threads.

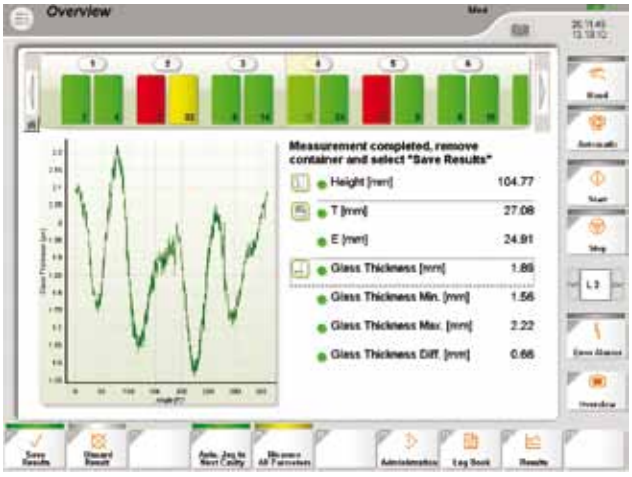
gauges, calipers or optical comparators.

MiniLab's precise measurement data shows when a particular mould is trending towards an out-of-tolerance condition, allowing the bottlemaker to make adjustments or perform maintenance before any defective containers are manufactured.

IMPROVED QUALITY

In conclusion, early defect detection and corrective action are key to increasing pack rate and improving quality. Defect detection at the hot end, bridging the information from the cold end, correlating inspection machines with automatic statistical sampling and providing access to images of defects at the hot end all offer the potential for early corrective action, leading to lower defect rates, increased revenue and better product quality.

Emhart Glass strives to provide the necessary tools for glass container manufacturers to improve their production through continuous process improvement. Long-term experiments at its research centre afford Emhart Glass the opportunity always to be at the forefront of innovation in supporting the glass container industry. ■



Graphical display of the measured wall thickness at a specific container height.

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