

Bottle inspection at the cold end

JOCHEN SCHULZE EXPLAINS HOW COLD END INSPECTION DURING HOLLOW GLASS PRODUCTION CAN BE QUICKER AND MORE ECONOMICAL

busch & Spreen, working in conjunction with sensor manufacturer Precitec Optronik, has developed the ISM inspection machine for use in hollow glass production.

By fitting the CHRocodile M4 thickness measuring system, the machine is capable of the contact-free inspection of up to 350 non-round containers per minute for thickness, glass shape, roundness and glass quality. This measuring system can read and reliably inspect all hollow containers; bottles can be various shapes and colours, may have steeply sloping surfaces or even angled sides. Practically all round or non-round individually formed products can be measured, and inspection can cover all areas of the product – varying distances from the optical probe and the colour of the bottles being inspected will have no effect on the accuracy of measurement.

A MODULAR MEASURING SYSTEM

The CHRocodile M4 measuring system, which is built into the inspection machine, is modular in structure and uses a robust method for chromatic measurement of wall thickness configured by Precitec Optronik. This method entails white light being guided down fibreoptics to the measuring head. The optical probe comprises a lens with a known chromatic aberration which focuses the light emitted from the optical fibre onto the glass surface to be measured, according to the wavelength. A spectrometer then analyses the reflected light and calculates the material thickness from this with high precision.

Up to four independent measuring points record the glass thickness between 0.1 mm and 35 mm, depending on the head option and the form of the product, regardless of whether the bottles are smooth, have relief moulding or

are engraved. CHRocodile M4 operates at a high measuring rate of 4000 measurements per second so that even at high belt speeds of 4 metres/second, it is able to detect the smallest flaws.

EASY INTEGRATION

The temperature of the glass or streaking effects due to ambient air do not affect measuring accuracy. The CHRocodile M4 captures the data just as reliably at the cold end of hollow glass production as inline at the hot end of the bottle production belt. The sensor is able to report any quality defects detected to the process control system via RS 232 and RS

CHRocodile series of sensors. The sensor's full command set and DLLs are available for use by plant designers so that the CHRocodile M4 in its 19-inch rack can easily be incorporated into existing inspection stations.

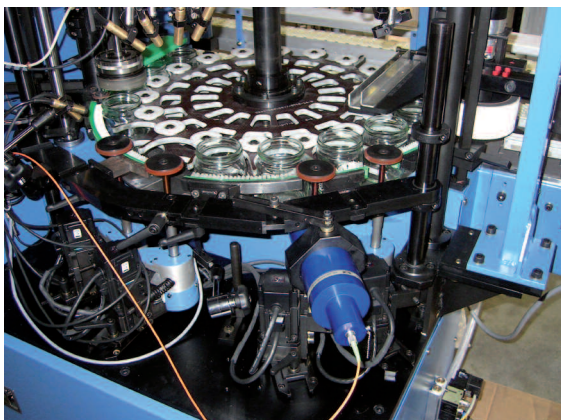
IN SUMMARY

The CHRocodile M4 contact-free measuring system offers the following benefits for glass bottle production:

- Monitoring of glass thickness and roundness
- Measurement of round and non-round shaped items
- Measurement of clear and coloured glass containers
- Ensuring product quality through 4000 measurements/second
- Reliable data capture at the cold end of hollow glass production and from hot glass
- Rapid detection and prevention of faulty glass containers
- Simple adaptation due to the modular design of up to four measuring heads
- Can easily be integrated into the production process (plug & play)
- Highly precise, rapid and robust.

The benefits to the user are an increase in bottle quality, and an increase in economic efficiency in bottle production. ■

THE MODULAR CHROCODILE M4 THICKNESS SENSOR WITH FOUR OPTICAL PROBES



THE ISM INSPECTION MACHINE CHECKS UP TO 350 GLASS CONTAINERS PER MINUTE FOR WALL THICKNESS, FORM AND QUALITY

422 interfaces. This can be achieved without the need to take specimens during the production process and then, where necessary, readjusting the plant after the production of a number of defective products.

The CHRocodile sensor can easily be integrated into existing plants from different manufacturers. The sensors have been calibrated in the factory and are designed for years of maintenance-free operation. A comprehensive software package can be supplied for the automatic analysis of measured values; it is based on the experience gained in several hundred installations of the

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