Multi-view monitoring for automatic gob weight control

Specialising in and leading innovations of advanced sensor and robot technology, XPAR Vision's products and services help to improve the forming process performance and quality control for the global container glass and tableware industries. Paul Schreuders explains how the company's latest sensor enhances its portfolio of solutions and offers a precise way to monitor the gob forming process and maintain automatic weight control.

Paul Schreuders is Chief Executive Officer at XPAR Vision.

Since early 2000 XPAR Vision has been active in the global container glass industry. At first with the application of infrared sensor technology for hot end inspection and process monitoring, and since 2003 also with automatic gob weight control by means of InfraRed data (InfraRed Gob weight Control system, IGC).

XPAR Vision's goal is to offer sensors for every important subprocess in the forming area: from gob cut until bottle forming. And evidently until now a sensor for detailed monitoring of the gob forming process was still missing. Also in order to follow customers' requirements, the company's original automatic gob weight control function has been extended with a dual camera system for dimensional monitoring and control and converted into a new product: the GobMonitor.

GobMonitor

XPAR Vision's GobMonitor is an innovative sensor system for gob inspection, gob forming process monitoring and automatic gob weight control. The GobMonitor is built around two high resolution optical sensors. With these two sensors, 3D images of all gobs are created. The two high resolution sensors come in just one physical box, making the system simple, robust and easy to install. Through the smart application of multi-view vision a high level of measurement accuracy is achieved. It works for single, double, triple or quad gob feeders. The GobMonitor can be used as stand-alone system or in combination with the other XPAR Vision sensors. Being suitable for NNPB, PB and BB, the system is designed to help container glass and tableware manufacturers to increase their gob forming process capabilities.

Gob inspection and monitoring

The 3D images of all gobs are processed in real time and the image analysis calculates the following parameters of the gob: length, diameter, volume, shape and tilt (gob orientation in X-/Y-direction). From these variables the weight of the gob is obtained and temperature changes can be observed. The measurements are stored and displayed in trend graphs. As a result, statistical variation of the gob forming process as a whole is monitored in real time.

Ideal gob parameters can be set for any job and used as a reference. Deviations from this reference are displayed in a user interface with a warning alarm if defined limits are exceeded. Based on these alarms the operator is able to stabilise the gob forming process and act upon deviations beyond alarm limits set. For example, it is possible to monitor the shear condition and be alerted in case shears need to be adjusted and/or replaced, but it can also help the operator to optimise the gob condition during a job change.
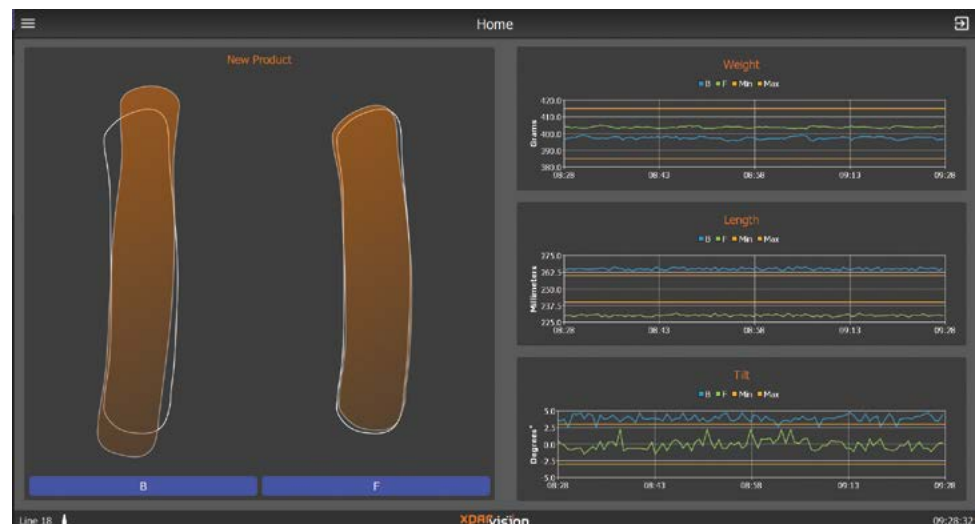
Example of a user interface.

XPAR's GobMonitor: two sensors in one box.

Automatic gob weight control

One of the measured parameters is weight. In addition to monitoring the weight of each falling gob, the weight differences between gobs are also measured. Through smart integration with tube and/or needle controls this difference in weight can be eliminated through small automated adjustments to tube and/or needles. In this way the gob weights are kept constant automatically. Contrary to single sensor systems, the GobMonitor's innovative multi-view technology ensures the tilt of the gobs has no influence on the gob weight measurement. Therefore the gob weight control function of the GobMonitor is very precise and accurate. For only tube control a standard deviation of 0.2% is feasible. Logically, the accuracy for needle control is higher.

Using the GobMonitor and its automatic weight control means that it is no longer necessary to manually catch gobs to determine their weight. As such, the GobMonitor offers a great contribution to a safe working environment.

Benefits

The GobMonitor is easy to install, maintain and to operate. It improves the quality of the gobs and shortens the job change time. Therefore, the GobMonitor improves the stability and thus productivity of the gob forming process and has a fast ROI. Accordingly, the quality of bottles produced is improved along with the productivity of the container forming process. And as previously mentioned, the GobMonitor contributes to a safe working environment.

Combining with other sensors

As with all XPAR Vision sensors, the GobMonitor's data is stored in the central database and can easily be retrieved and used for several purposes including reporting. From this database open data connections to standard and proprietary production information systems are possible. This allows measurements of various sensors, e.g. correlation with gob loading parameters measured by GobAssist, glass wall thickness variation measured by IR-D, or integration with nine grid forehearth temperature control.

With the addition of the GobMonitor, XPAR Vision's product portfolio is complete: at all critical sub processes of the glass forming (gob forming, gob loading, bottle forming) there is a sensor to give factual information. Factual measurements provide the basis for optimisation and are a necessity for controlling the forming process up to a higher level. ●

About the author:
Paul Schreuders is Chief Executive Officer at XPAR Vision

Further information:
XPAR Vision BV, Groningen, the Netherlands
tel: +31 50 316 2888
email: sales@xparvision.com
web: www.xparvision.com