

Bucher Emhart Glass launches 'End to End'

Bucher Emhart Glass is rolling out a suite of automation technologies for all stages of the container glass production line under the umbrella brand 'End to End'.



▲ The FleXinspect machine from Bucher Emhart Glass.

Bucher Emhart Glass (BEG) can look back over more than 100 years of innovation and commercial success. In its original incarnation, the firm developed the core technologies for forming molten glass into containers that are still used throughout the industry today. Since then, the company has grown consistently and delivered many more innovations.

BEG has a global presence, with manufacturing facilities in Sweden, the USA, Malaysia and China, a headquarters in Switzerland, and sales and support offices on all five continents, plus a research centre in the US.

A team in excess of 1800 people works together to design, develop, manufacture, install and support BEG technologies. Total annual sales are around €335 million and an incredible 115bn bottles are produced each year with the company's machines—almost 40% of total world output.

Listening to customers

One of BEG's core principles is to listen carefully to its customers. Throughout 2015, the company sat down with customers around the world to get a better understanding of today's biggest

challenges and to discuss what solutions were expected from BEG as its equipment and service partner.

Three themes were consistently mentioned: Customers expect BEG to continue delivering on its brand promise; supply best-in-class quality; and develop cutting-edge innovation.

They seek a long-term partnership with their supplier and want to be involved in the development process.

Finally, customers believe that the biggest innovations will come in the area of closed loop technology and process automation, maximising production efficiencies while reducing dependency on skilled operators. Having Hot End and Cold End under one roof, customers believe that BEG is best positioned to take total process control to a next level.

The objective of every glass plant is to achieve high capital utilisation, run at consistently high pack rates with low defect levels, minimise downtime and deal with changing market demands. The equipment and technology used plays an important role, as different machine types differ in potential, reliability and cost of ownership.

However, beside the technology used, a critical success factor today is the

operational know-how in a glass plant and the skills of the machine operators.

Many glass plants suffer from know-how gaps and face increased difficulties in attracting talent to a seemingly unattractive industry.

It is no surprise that knowledge drain is seen as the single biggest challenge in forthcoming years by many glass plants.

Introducing End to End

BEG's response to these challenges is a comprehensive product and service called 'End to End', which comprises a unique set of solutions and automation technologies. BEG states that 'End to End' will make glass production easier, efficient and safer, and will support glass plants in supporting know-how gaps.

End to End will take a holistic view of the production process, unifying BEG's Hot End and Cold End.

BEG has responded to its customers' request to be involved in the development process and is offering a deep insight into the development roadmap of the coming years. Many solutions are available already today and more will be launched in the next years.

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Information systems

Some key developments are targeted toward extracting relevant information from an increasing stream of data.

The Plant Information System will aggregate production data from throughout the plant, providing an overview of key parameters such as efficiency rates, machine speeds and furnace pulls.

The Control Centre will be the central hub for the entire forming and inspection process. It will consolidate data from today's numerous sensors and process monitoring systems, providing operators with a much simpler overview of the relevant production information.

Both the Plant Information System and Control Centre are based on FlexIS technology, resulting in an integral FlexIS End-to-End control system

An integrated Defect Expert System will also display actual defects at the Hot End and propose possible corrective actions to the operator.

With the inclusion of measurement data, such as blank temperatures or press durations, defect causes can be significantly narrowed down.

Process control and automation solutions

A high focus will remain on closed loop developments. After the successful launch of BEG Plunger Up Control and Blank Temperature Control, future closed loop systems will use multi-variable controls, combining data from different areas of the forming process. Ultimately, defect data from the cold end will be included, automatically adjusting the forming process to prevent defects.

Sending data upstream, Automatic

Sensitivity Adjustment will provide safeguards when the forming process deviates from its control limit.

For example, temperature sensor data from the Hot End can be used to automatically alert inspection to potential hot-plunger defects.

Robots will play an important role in automating certain tasks, such as swabbing. Swabbing robots are available today and can be implemented on BEG machines. Further applications, using robots for tasks such as automatically adjusting deflectors based on loading data, will follow.

Simplified man machine interfaces

BEG's new safety controls drastically simplify setup procedures while increasing operator safety.

The new system electrically isolates the Blank and Blow side and monitors invert and takeout mechanism through an independent safety module.

This allows operators to work on Blank and Blow side simultaneously, maintaining the capability to move mechanisms whenever required.

Application Oriented Programming will change the way machines are programmed. Rather than specifying timing drum start-and stop angles for mechanism motion and forming events, the users will focus on forming and process durations. The control system will automatically manage the collision-free motion of mechanisms, moving as fast as necessary and as slow as possible.

Condition Monitoring and Preventative Maintenance tools will help plants schedule repairs proactively to minimise unplanned downtime. Cycle-

and runtime counters, air consumption monitors as well as self-monitoring servo drives will provide key information on on wear-time and replacement timings.

Inspection Technology – Scout

SCOUT, the first element of End to End to be released, is the intelligent software behind BEG's inspection technologies. It increases accuracy and control and supports fully modular expansion and upgrades in the future.

In the glass plant of the future, the production process will be known and managed with a thoroughness that would amaze the glassmakers of the past. Integrated equipment will read, analyse and react to data completely automatically. That will allow plants to achieve better performance, efficiency, safety, traceability and reliability, ultimately leading to higher profits.

The other side of the End to End coin is support. BEG's team is there to help and advise its customers at every stage, from choosing and specifying the right equipment through to ongoing parts and maintenance. That support continues once the equipment is installed, as BEG's production experts work with customers to optimise production throughout the line.

Ideal partner

The End to End offering makes perfect sense for a company that has traditionally been an industry leader in Hot End, but has also made huge strides in terms of its inspection offering over the last decade, as well as all-round improvements to its electronic controls.

"Our new offer to customers is very simple: one plant, one partner," says Martin Jetter, BEG's President. "We fully understand why, in the past, glass plants may have wanted to cherry-pick technologies from different suppliers.

But with the skills gap and economic reality we all face, things have changed. To get the best return on assets, it makes sense to work with a single supplier who understands every area of the plant.

"Once, our job was to sell a machine, then maintain it," he adds.

"Now, we see our job as helping a glass plant run as efficiently and profitably as possible. That's why End to End is our future, and we hope it's a future our customers will share."

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