

Using smart sensors to deliver powerful results

Data is power but only if the data is accurate. Andreas Helfenstein and Martin Grönblad detail how smart sensors developed by Bucher Emhart Glass allow automatic adjustments and process improvements that can translate into significant time and cost savings.

GobRadar checks each gob immediately after the shear cut, registering parameters such as weight, temperature, angle, position, trajectory, length, diameter and so on. The user can view continuous analysis in real-time, enabling monitoring and traceability right from the start. Emerging trends can be spotted as soon as they arise and the process overall is made much more stable.

The shape of the gob can be compared to a previously saved 'best' shape, which helps to reduce time spent on job changes. The system also supports multiple weights, making job changes even faster.

With closed-loop control, process adjustments can be made automatically based on live measurements of each gob, rather than merely each time weight is measured manually. That reduces the demand on the operator and makes for increased efficiency.

Gob loading

Problems with gob loading can sometimes be at the root of defects. However, the aim is usually to rule it out as a cause. BlankRadar provides valuable information on the gob loading process, reducing human-machine interaction to safeguard operators' wellbeing.

Blank cooling control

FlexIS blank cooling control works with BlankRadar or TCS to keep blank mould temperatures within a tightly defined band. Using machine-controlled individual cavity cooling frees up operators from permanently monitoring and adjusting up to six cooling valves per section.

Plunger process control

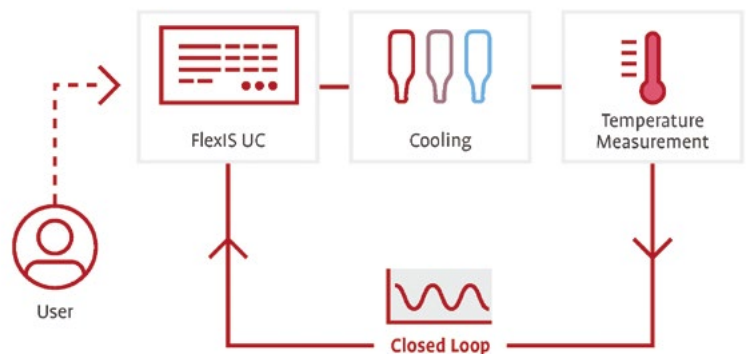
The Plunger Process Control System, or PPC, monitors individual plunger motions during the NNPB and PB parison forming process. The system uses full stroke sensors and a method to eliminate cabling in the plunger mechanism. PPC controls gob weight automatically, using closed-loop technology to adjust tube height and individual plunger needles in the feeder. The display shows the full plunger stroke profile by cavity, allowing press time and plunger up profile to be optimised. Profiles can be stored electronically.

Plunger up control

FlexIS plunger up control was the first closed-loop system introduced by Emhart Glass. Along with plunger process control (PPC), it helped to make the pressing process in press-and-blow far more stable.

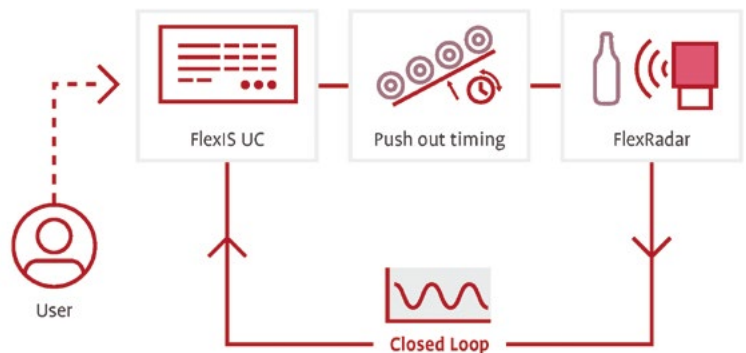
Plunger up control makes automatic adjustments to achieve up to three distinct pressure steps during the pressing process. These steps are essential to manufacture certain items – but almost impossible to achieve and maintain with manual adjustments.

FlexIS Blank Cooling Control



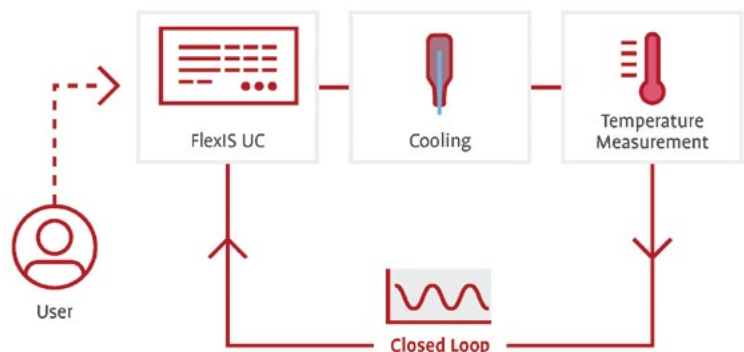
FlexIS blank cooling control keeps blank mould temperatures within a tightly defined band.

FlexIS Bottle Spacing Control



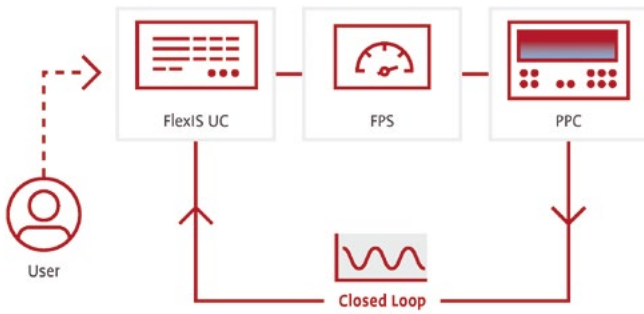
Bottle spacing control ensures that ware is equally distributed on the conveyor.

FlexIS Plunger Cooling Control



The Plunger Process Control System monitors individual plunger motions during the NNPB and PB parison forming process.

FlexIS Plunger Up Control



Plunger up control makes automatic adjustments to pressure steps during the pressing process.

Plunger up control has since been installed in many glass manufacturers' production lines worldwide.

Forming process monitoring

The sooner defective containers can be identified and rejected, less money is wasted on processing unsellable wares. Traditionally, this was a job for trained forming specialists and operators, which often meant a drop-off in quality when they clocked off from their shifts. Now FlexRadar can take over, keeping a watchful eye on all newly formed ware and rejecting any that violate process limits. At the same time, the system also gathers statistics to support further process improvements.

FlexRadar also has the ability to register the average energy radiated from formed containers, which in turn allows it to measure glass mass. Using an interface to the tube, the system then automatically holds the weight steady at the setpoint.

Bottle spacing control

FlexIS bottle spacing control ensures that ware is equally distributed on the conveyor. Using data from FlexRadar, it automatically corrects the push-out angle for each section, as well as other factors, such as pocket air, that are linked to the pushout. When the system is fully integrated into FlexIS, the operator can alter FlexPusher parameters or conveyor offset and the system will compensate to maintain even ware spacing. ●

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