

FlexRadar system to reject defective wares

Bucher Emhart Glass' FlexRadar system allows glass container producers to reject defective wares as soon as they are formed, as well as using live production data to optimise conveyor spacing.

Cold end inspection technology is improving all the time, using automation and sophisticated imaging to detect and reject wares that fall short of quality standards. But for all its accuracy, Cold End data can only be utilised after the annealing lehr which delays the feedback signal as well as the process correction.

To address this challenge, Bucher Emhart Glass (BEG) is constantly working to improve its control and inspection technologies throughout the production line. With its FlexIS Plunger Up Control, introduced six years ago, it took the first step towards closed-loop control, where 'live' production data is used to automatically adjust and optimise the production process in real time.

One of BEG's most recent innovations in this area is FlexRadar, its Hot End Process Monitoring and Inspection system. FlexRadar uses high-resolution infrared cameras, positioned at angles either side of the conveyor, to measure the energy that radiates from newly formed glass containers as they leave the Hot End for the annealing lehr. The measurements are used to produce a thermal image of each container.

The system monitors and records each container's shape, glass distribution and position on the conveyor. Any containers



that fall outside the limits for the process are automatically rejected, and cavities or sections producing outliers are quickly reported to the operator, to allow the problem to be fixed.

The versatile FlexRadar can also detect down and stuck ware, thin/wedged bottom, leaners, thin spots, bird swings, inclusions, freaks, fin defects, chocked bore and thin neck.

All details are recorded, including total reject numbers, causes and the characteristics and spacing of rejected wares. By reviewing long-term data, users can see the effects of swabbing, mould changes and event changes.

Live thermal images

An overview on the control screen shows live thermal images of every container, giving operators a 'window' into production as it unfolds. However, FlexRadar never sleeps – even when the operators finish their shift, the system keeps on monitoring, rejecting and recording.

FlexRadar acts as a pre-filter for cold end

inspection, and allows rapid corrective action on the root cause of the problem. However, it can do even more. When allied with BEG's closed-loop technology,

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the settings of its FlexPusher technology can be adjusted automatically based on FlexRadar data, optimising the spacing of bottles on the conveyor in real time. This minimises interference on the conveyor and prevents jams at the ware-transfer stage.

In this setup, BEG's FlexIS control system monitors the position deviations recorded by FlexRadar and makes automatic corrections to the timing and push-out angle of each forming section as required. FlexIS automatically calculates the limits to push-out angle changes based on the control parameters for each section.

Once the integration is in place, the operator can make changes to FlexPusher parameters or the conveyor offset without risking any disruption. The system will respond intelligently to the new settings, keeping containers evenly distributed, just as the user would expect.

FlexRadar and bottle spacing control are available for all types of BEG machine. FlexRadar supports both tandem machines and forming lines that produce multiple items, and works with both round and non-round container shapes.

The system allows real-time data gathering, data archiving and integration

with production reporting as well as remote monitoring for support.

"FlexRadar is a vital building block in our rapidly developing closed-loop production system," says Martin Grönblad, Product Manager at Bucher Emhart Glass. "By checking containers before they even reach the Lehr, it allows glass container producers to filter out unsellable wares and therefore spend less money taking them through the rest of production. Once manufacturers bring in bottle spacing control, they save even more, with smoother transit on the conveyor and fewer jams. Overall, this is a great way for manufacturers to streamline production and improve pack-to-melt ratios."

"One of the main goals of having these type of sensors and robotic products under the Bucher Emhart Glass brand is to integrate them into our machine and control systems. By exchanging data between all of these systems, the operation of the equipment will become less operator dependent and allow increased performance". ■

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