Hot-end process stability strengthened with TME ENGINEERING systems

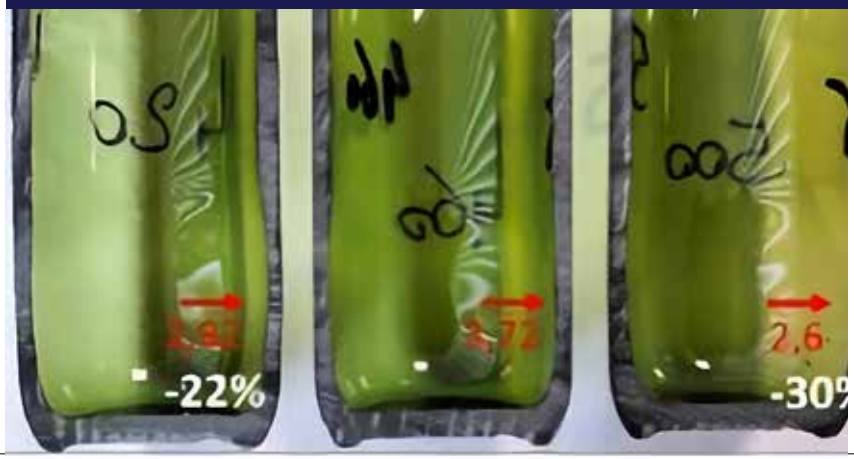
Lightweighting glass containers remains a central objective for the glass industry, driven by sustainability imperatives, reduced raw material and energy consumption, lower transportation costs and compliance with increasingly stringent environmental regulations. Achieving meaningful weight reductions while preserving mechanical integrity, burst resistance and overall product quality requires exceptional control over critical hot-end parameters. Effective lightweighting depends on four closely interrelated factors: precise control of gob weight consistency, optimal gob shape and delivery, optimised blank (parison) geometry design and -most critically- accurate thermal management during the forming process.

THE CRITICAL ROLE OF THERMAL CONTROL

Thermal control is fundamental to achieving uniform glass distribution, defined as the even repartition of wall thickness throughout a container. Temperature gradients within the blank mould directly influence glass viscosity and flow, resulting in asymmetric thickness profiles. These variations create localised thin spots, which are more prone to breakage, alongside areas of unnecessary excess glass. Together, these effects significantly limit the extent to which lightweighting can be pursued without compromising quality. A practical demonstration of this phenomenon was observed during a trial conducted with a partner operation. By intentionally introducing a thermal imbalance between the left and right halves of the blank mould on an IS machine section, the resulting impact on glass distribution became immediately apparent.

In lightweight containers -where nominal wall thicknesses are already minimised- even small temperature deviations of just a few degrees Celsius can produce unacceptable thickness variations. This increases defect rates, rejection levels and the risk of failures in the field.

Cross-sectional views of trial bottles illustrating the consequences of thermal imbalance in the blank mould. From left to right: Reference bottle / Left-side imbalance / Right-side imbalance. Red arrows indicate measured wall thicknesses (in mm) and percentage deviations, with thinner zones reaching up to -30 percent on the affected side. Such variations make reliable lightweighting unachievable.



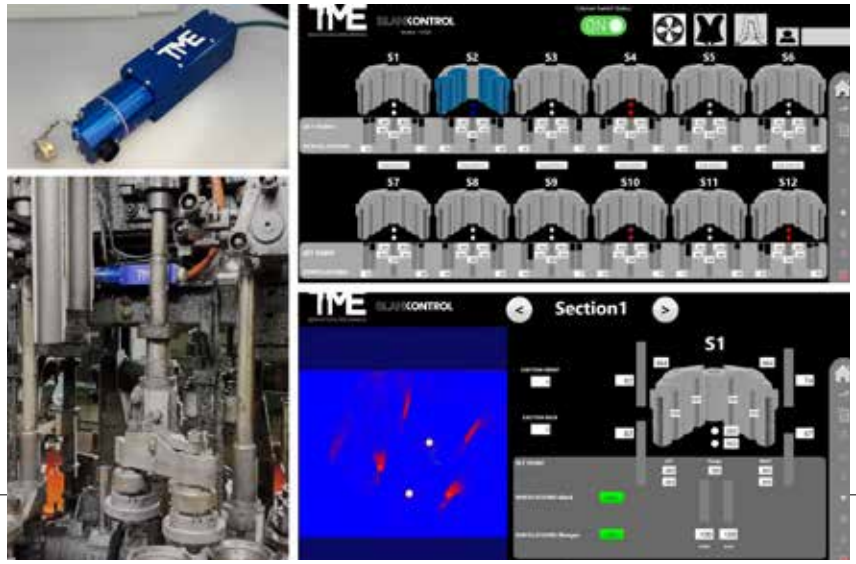
Advanced thermal control is transforming glass container lightweighting, with TME ENGINEERING's Blankontrol system enabling precise temperature monitoring at the forming stage. By improving glass distribution and process stability, manufacturers achieve significant weight reductions, enhanced quality and greater efficiency – all whilst supporting sustainability and reducing defects.

FROM MEASUREMENT TO MASTERY

This is where TME Engineering's Blankontrol system establishes its relevance. The system provides real-time, non-contact temperature monitoring directly at the blank side for every cycle across each section of the IS machine. Its performance is defined by a measurement precision of approximately 2°C, allowing reliable detection of even subtle thermal deviations. Equally significant is the absence of any calibration requirement. The system is ready for immediate deployment and maintains accuracy over time without periodic adjustment, simplifying installation, operation and maintenance in demanding production environments. When integrated into a closed-loop control strategy -such as automated adjustments to cooling air or mould temperatures based on Blankontrol data- the system enables stable and repeatable thermal conditions from cycle to cycle and across the entire machine. This level of control over glass viscosity and flow in the blank mould leads to highly uniform wall thickness distribution, eliminates systematic thin spots and asymmetries, and provides greater confidence in achieving aggressive lightweighting targets, including weight reductions of 10-20 percent or more without compromising performance. Additional benefits include enhanced process stability, faster job changes and reduced start-up times.

INDUSTRY ADOPTION AND FORWARD MOMENTUM

Leading players within the container glass industry are already deploying advanced thermal control solutions to address the challenges of lightweighting. By integrating such tools upstream in the forming process, manufacturers are supporting broader sustainability and efficiency initiatives. The transition from reactive, post-forming inspection to proactive, data-driven thermal optimisation at the forming stage represents a significant shift in process philosophy. Blankontrol directly addresses this upstream requirement and glass container producers worldwide are increasingly adopting in-process thermal monitoring solutions to strengthen their lightweighting strategies. In this context, precise thermal management is no longer optional - it is essential. Blankontrol enables manufacturers to achieve consistent glass distribution, unlock higher levels of weight reduction, improve sustainability metrics and deliver reliable, high-performance containers with greater efficiency.



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