

Developments of Tiamas Hot End sampling solutions

Sébastien Beltran* and Stephen Follis** discuss how the development of Tiamas hot end monitoring solutions provides key information of the glassmaking process

Tiamas has continued to develop its range of Hot End monitoring solutions called the Tiamas HOT Systems, providing key information on the Hot End process from the gob through to the fully formed container.

In 2016, Tiamas launched a sampling solution as part of this range called the Tiamas HOT lab. There are currently 30 Tiamas Hot lab machines installed globally at key glass container producers, covering five continents.

The Tiamas HOT lab is an automatic statistical solution providing quick, accurate, non-contact dimensional measurements of hot bottles. These measurements include glass thickness, internal bore, D-angle (tuck-under angle) sunk & bulge and all other external diameters.

Multi-Product production

The unique design of the Tiamas Hot lab ensures it provides accurate measurement solutions for the industry's range of glass container designs including non-round shapes. A new feature, added at the beginning of 2020, provides a solution for measuring Multi-Product production.

Multi-Product allows the user to place

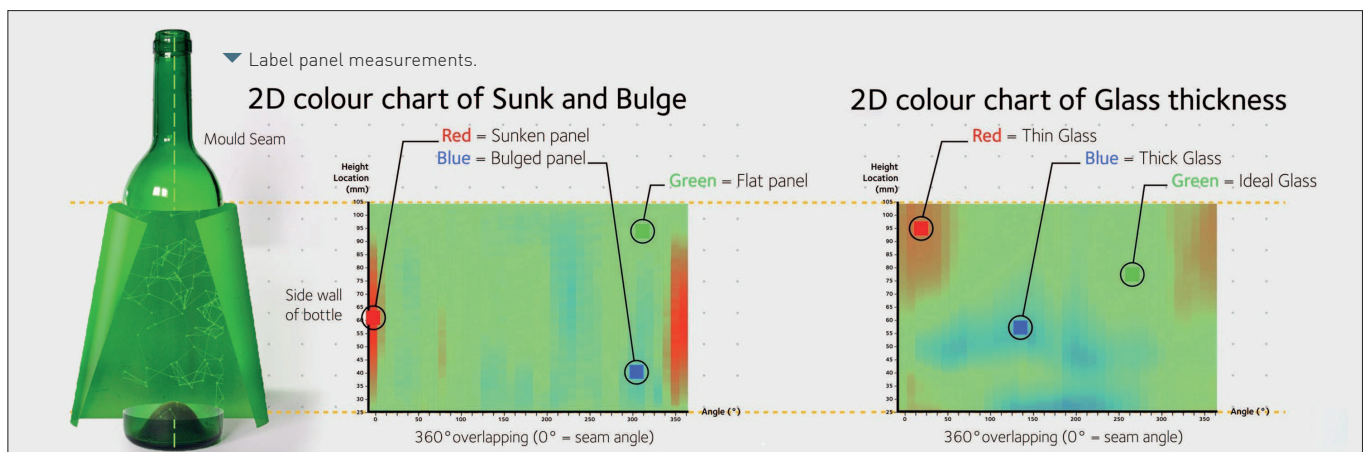


an assortment of bottles, varying in height, shape and diameter into the loading cart. The robot then finds, collects and places the bottles into the Tiamas HOT lab one by one and measures them all.

The new Multi-Product feature is

another element that now comes as standard with the Tiamas HOT lab. All existing machines can benefit from this function using the latest software update.

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Label panel measurements

Another feature proving to be beneficial for the various Tiama HOT lab users is the ability to measure the labelling panel. This measurement provides two key results, the flatness of the labelling area (sunk and bulge) and the vertical glass thickness/distribution. Both results can be presented in a 2D colour chart which displays the measurements 'un-wrapped'. The 2D charts identify the areas which have the most sunk or bulge and can be correlated with the glass thickness in relation to the mould seam and height location.

D-angle (Tuck-under angle)

In the past, it was only possible to measure this parameter in a laboratory using a shadowgraph comparator or dedicated camera-based machine. Now, with the Tiama HOT lab, measurement of the D-angle is fast, accurate and repeatable. Measuring the D-angle provides the Hot End operator the ability to decide when it is time to take necessary action before it becomes a critical quality problem.

Internal bore

Internal bore diameters ranging from 7 - 32mm and up to a depth of 50mm can be measured using the Tiama HOT lab. Internal profile graphics are presented together with numerical values in a simple report format.

The ability to provide an accurate measurement about the internal bore situation, rather than just no-go/go, ensures high quality standards can be maintained.

Increased confidence

Existing customers confirm that their main use of the Tiama HOT lab is production orientated. Measurement results identify the weaknesses in production, the operator can then implement a change on the IS machine followed by re-measuring a newly formed container to ensure their action resolves the problem. All users of the Tiama HOT lab confirm that confidence in the manufacturing process through measurement is provided.

Benefits from using the Tiama HOT lab help improve productivity and increase quality standards. In turn, this has led to existing customers ordering additional machines (typical is one Tiama HOT lab per furnace).

Some factories use the Tiama HOT lab mainly for verifying quality during and immediately after a job change. In addition, they also use the machine when producing a new sample. Being able to measure the bottles and create a report immediately at the Hot End reduces the down time of the full machine during this sampling phase. In the past, it would be necessary to wait for the bottles to reach the cold end before they could be measured accurately.

A return of investment approach

Measuring full sets of bottles on a regular interval (typically every two hours) provides one of the biggest returns on investment. SPC tools identify cavities and parameters that are drifting towards the process set limits. Reacting to these warning limits allows the Hot End operator

to verify the situation and act before a lehr full of bad bottles from one cavity occurs. Instead, their corrective actions can be made much sooner than relying on the Cold End inspection equipment to report the problem, followed by verifying the situation afterwards with confidence in the measurement results.

The operator still needs to collect the bottles and place them into the loading cart which takes less than three minutes on a 10-section double gob IS machine, but after this moment there is another financial saving. Instead of an operator spending an average of 20 minutes every two hours gauging bottles, the Tiama HOT lab carries out this work in an automated manner. Although installing a HOT lab doesn't necessarily mean you can reduce the number of Hot End operators, what it does provide is more time for the operator to do more meaningful tasks such as focusing on optimising the forming process.

A smart factory oriented solution

The Tiama HOT lab is perfectly in line with the Tiama Smart Factory concept YOUiverse. The machine collects measurement data from all samples and performs automatic and protected reports. Thanks to data, the communication between the Hot and Cold End is improved with a positive impact on internal process quality. ■

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