

Latest technology in hot end trend analysis

MIKLOS RUPP DESCRIBES THE BENEFITS OF VISIBLE LIGHT CAMERAS COMPARED TO TRADITIONAL INFRARED TECHNOLOGY

The hot end vision system, based on a visible light camera with backlighting technology, has been a proven application ever since the technique was first developed during the mid-1990s. It has recently been further refined and improved.

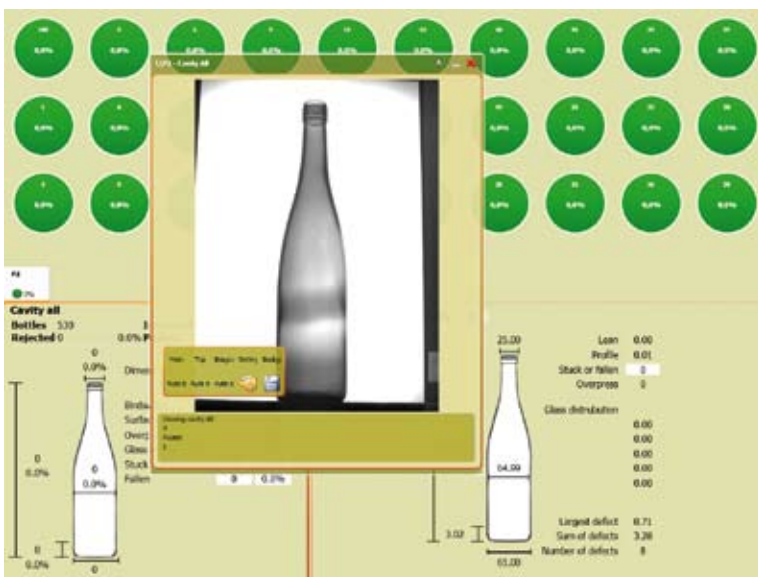
Compared to more traditional infrared technology, using visible

light cameras with backlighting has many advantages: the camera does not rely on infrared heat generated by the glass containers – the analysis is based on a real picture of the container and not on an image built up from heat radiation. This means that it is not necessary to compensate for fluctuations in the temperature of containers

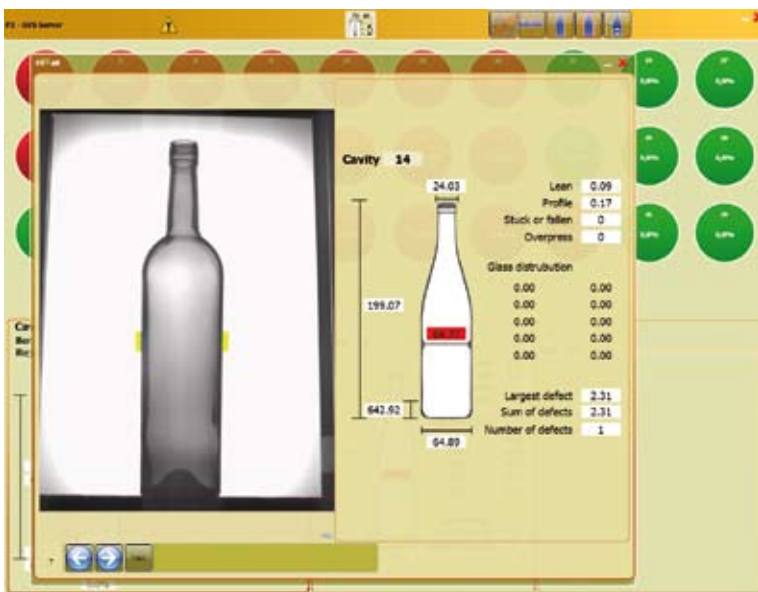
exiting the first or last sections of an IS machine, nor do the container's thickness or volume, or its retained heat, make any difference.

It is easy to analyse a lightweight container that loses a lot of heat early in the process, as the temperature is not crucial to the accuracy of the measurement. Radiation from adjacent containers also does not affect the accuracy of the measurement.

Pictures taken with a visible light camera and backlighting technology are clear and sharp, providing a high degree of accuracy in measuring the container's dimensions and distribution of material. This makes it easier to discover faults and inconsistencies while limiting the risk of mistaking high temperature spots for quality deviation.



A HUMAN MACHINE INTERFACE (HMI) IS EASY TO LEARN AND USE FOR THE OPERATORS



A LOGICAL AND INTUITIVE STRUCTURE FOR EASY OPERATION OF THE GVS SYSTEM



SCHEMATIC SET UP OF THE GVS SYSTEM, CONSISTING OF ONE CAMERA MODULE AND ONE BACK LIGHT MODULE

INCREASES IN PRODUCTIVITY AND QUALITY

In the early 1990s, measuring and inspecting glass containers at the hot end, only a few seconds after being formed in the IS machine, was an innovative concept. Even today, when the technology for hot end inspection and measurement is readily available, it is still traditional in the glass industry to do most of the quality and process control at the cold end.

However, there are many advantages to controlling the product quality and process earlier in the manufacturing process. Using the right hot end trend analysing tool, it is possible to detect and react to deviations sooner, which increases efficiency and helps to ensure high quality in manufacturing glass containers.

Waiting for a result at the cold end can take up to two hours after the container is formed; this can be achieved at the hot end immediately.

Cold end inspection equipment cannot find every faulty container. Reducing the number of defective products reaching cold end inspection improves the total quality output of the whole process. Discovering incorrect containers using hot end trend analysis further enhances product quality and increases efficiency by not wasting resources on incorrect containers.

HIGH PERFORMANCE

Experience from installations in the glass container industry shows that using a hot end trend analyser achieves a 3% improvement in yield. With the GVS (Glass Vision System) concept, the machine operator can instantly recognise if any containers are outside tolerated variances, and over time can see trends in all measured parameters produced by each mould. As well as comparing measurements to the container tolerances, it can also reject containers. This simple function ensures that fewer defects reach the cold end. Enabling the machine operator to concentrate on other areas of glass production can improve the overall production performance.

The GVS concept is not intended merely as a sorting device, but as a statistical instrument for hot end trend analysis. The emphasis is on telling the operator how the IS machine is performing while enabling critically incorrect containers to be rejected.

Using this technology makes it possible to reduce

time spent on job changes.

Fast results from measuring hot containers mean that necessary process adjustments can be carried out instantly.

EARLY DETECTION OF VARIATIONS AND FAULTS

Numerous variations and critical product defects can be detected using the system, which can also measure and analyse faults and trends in product variation. The system provides real-time trend-based data and detection, rejecting containers with incorrect critical parameters.

The system can detect a whole series of bottle surface faults, such as birdswings, stones, seeds, blisters, wings and over-presses, and can record deviations in dimensions, lean etc. It also highlights irregular material distribution and movement.

Modern technology in the GVS hot end trend analyser gives glass container production a higher level of accuracy and aims to improve efficiency, productivity and profitability in glass container manufacturing. ■

ABOUT THE AUTHOR:

Miklos Rupp is Product Manager at Gedvelop

FURTHER INFORMATION:

Gedvelop AB,
Helsingborg, Sweden
tel: +46 42 38 66 70
fax: +46 42 20 16 86
email: info@gedvelop.com
web: www.gedvelop.com

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