

Continuous updating to keep pace with market demand

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The warning came four years ago as a broad cross-section of Emhart Glass technicians and engineers, as well as sales and marketing executives, were beginning to draft concepts for a completely new portfolio of glass container inspection systems.

In a hand-written fax, an Emhart Glass systems engineer, who was

AFTER FOUR YEARS OF RESEARCH AND DEVELOPMENT, THE INTRODUCTION OF A FURTHER INNOVATED INSPECTION SYSTEM, PART OF THE VERITAS SERIES, IS TO BE PRESENTED TO THE MARKET BY ITS CREATORS - EMHART GLASS - IN 2004. THE DECISION TO INTRODUCE THIS MODULE WAS TAKEN AFTER GATHERING COMMENTS FROM ITS CUSTOMERS REGARDING THE NEED FOR FACILITATED SET-UP AND MORE DETAILED INSPECTION POSSIBILITIES.

at a customer site struggling with an older inspection machine, cautioned that current vision inspection was not meeting the customers' needs for simple, easy set-up. The fax outlined in detail what the engineer was struggling with and what, he said, customers were saying they wanted.

Almost four and a half years later, these demands are being realized in the completion of the Veritas Series inspection systems from Emhart Glass. The introduction of the third module in the new Veritas series of inspection systems, Veritas iC, fulfils the demand for high-speed, high-resolution

Veritas iC open, demonstrating easy access to the inside of the machine



accurate and robust inspection in a fully-automated, easy to use inspection platform. The iC establishes new milestones in glass container inspection technology.

THE VERITAS FAMILY

Encompassing three modules, the last expected to be released in the first part of 2004, Veritas performs almost every inspection currently available to the industry, as well as new inspections - some available for the first time in an on-line system.

The first two modules (the *Veritas iM* and *Veritas iB*) were released in 2002 and 2003 respectively. The *iM*'s innovative approach uses both servo-controlled mechanical components and a servo-controlled star wheel ware handler. It performs basic inspections such as plug/ring and dip/saddle/height gauging, check detection, optical wall thickness inspection, and heel dot code mould number reading.

The *Veritas iB* utilizes software-programmable stepper motors to control bottle handling and optics assemblies to provide fully automated vision inspections for

sealing surface, base, base stress, plug, and dip/saddle/height measurement. Mould number reading is available in both the *iM* (for standard dot code reading), and in the *iB*, with vision mould number reading of base and heel mould codes (dot, peanut, and digital alphanumeric). Both the *Veritas iM* and *iB* use software-programmable mechanisms and quick-change adjustments, as well as an intuitive graphical touchscreen user interface to simplify set-up and reduce job change time - especially on repeat jobs.

Ease and precision

The *Veritas iC* meets and exceeds the demands for set-up ease and precision in glass container sidewall inspection. Once installed, job set-up on the *Veritas iC* is virtually hands-free. With the exception of bottle spacing, which is performed by an optional bottle spacing device or controlled by an upstream *Veritas* module, there are no moving parts to adjust.

Reduced complexity

Besides providing a comprehensive approach to sidewall and

dimensional inspection, the *Veritas iC* dramatically reduces the complexity of this increasingly critical inspection. All inspections are performed without interrupting the natural flow of containers through the machine. Rather than using complicated arrangements of precision mirrors, periscopes and fixed directional light sources, the *Veritas iC* folds the optical path and uses patented software-controlled LED light panels that enable optimal inspection for both transparent and opaque defects. The simplified optical path and use of multiple cameras reduce the opto-mechanical set-up, so inspection throughout the machine's ware range requires no camera or lens changes.

OPTICS DESIGN AND HIGH-SPEED VISION

The unique optics design and high-speed vision processing electronics allow the system's six cameras to capture and analyze 12 images of the container as it passes through the *iC*'s two inspection stations. In the first station, three cameras take six images, which are analyzed nine ways for



The Veritas family of inspection systems

opaque, transparent and dimensional defects.

In the second station, another three cameras take six more images, which are analyzed for opaque and sidewall stress defects. For sidewall stress, the Veritas iC uses a proprietary polarizing configuration that enables the same camera to perform both sidewall aspect inspection and sidewall stress inspection.

The use of six fixed-focal length lens/camera modules in two stations also permits distortion free 360° non-contact inspection - at sub-pixel resolution - at speeds of up to 600bpm. The Veritas iC is capable of seeing defects as small as 0.350 square millimetres over the entire container height range (38-381 millimetres [1.5-15 inches]).

SET-UP

A complete new job set-up on the Veritas iC takes less than 15 minutes - even if the job is to a different colour container. Set-up on a repeat job can be completed in seconds since it involves little more than the time required to recall the job from memory and loading it. It is not even necessary

to open the covers of the machine.

For new set-ups, the Veritas iC uses a series of automated set-up procedures similar to the “wizards” common in many office software programs. The automated set-up program walks the operator through the various set-up tasks, instructing how to set bottles in place in an inspection area or how to run a series of known good and known defective bottles through the machine. During this process, the system learns the size, shape and colour of the container, automatically adjusts the light intensity and lighting patterns on the machine’s LED light panels, and places inspection zones over the various areas of the container. The system even recommends inspection sensitivities based on the differences between good and defective containers used during set-up. These settings, as well as inspection zone placement and size, can be fine-tuned and tested on line while normal container inspection is taking place.

EASY ACCESS

Designed with maintenance in mind on three-dimensional CAD systems, the Veritas iC has very easy user access to the lights and mirrors, and cleaning or changing mirrors requires no tools. Optics arms and front access panels can open fully to allow operators to literally walk into the machine to perform troubleshooting or routine maintenance and cleaning. Powerful electromagnets, as well as fixed-position assemblies, enable the optics arms to be returned to their precise alignment when closed.

Even the Veritas iC’s electrical panels are designed for easy access. All wiring, including cabling to the system’s two vision processors and supervisor computer, is accessible from the front of the machine - virtually eliminating the need to open the back of the machine.

Though the Veritas iC offers the most sophisticated and com-

prehensive sidewall/dimensional inspection available, it does so without adding complexity to the man-machine interface. Besides being mechanically simple, the entire Veritas inspection series uses intuitive touchscreen displays that are designed to have a common look and feel to make inspection set-up and operation easier. The Veritas user interface also enables quick, secure, remote access using a web browser.

RESPONDING TO DEMAND

The demand for improved, easier to use inspection technologies has been the guiding principle in the development of the Emhart Glass Veritas series. Each of the Veritas modules can be installed and operated independently, or close-coupled to function as a fully-integrated inspection system to offer a range of inspections and a level of reliability and precision unmatched in the glass container industry.

Emhart Glass has a tradition of understanding customers’ needs and setting standards for both glass container forming and for glass container inspection. The introduction of the Veritas series applies more than 60 years of experience in glass container inspection and more than 80 years of working as a partner to glass container manufacturers worldwide that has made Emhart Glass a world leader in glass manufacturing technology.

*Product manager
for inspection
equipment
**Manager
of Research and
Development for
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