

New Veritas vision systems offer sophisticated inspection precision in simple package

Richard D Diehr introduces a new standard for inspection.*

The goals were simple: provide customers with the most accurate, precise inspection but at the same time reduce the complexity of bottle handling, inspection setup and machine maintenance.

In a completely new product line, Emhart Glass set out to create a new standard for glass container inspection. The result is Veritas, a series of three machines capable of performing virtually all of the inspections currently required on a production line as well as others that are expected to become standard for many high-quality glass container producers. All of these machines, or modules, can operate stand-alone or together as a single, integrated inspection system.

Emhart Glass set the standards for glass forming and inspection throughout the 20th century. Today, at the beginning of the 21st century, Emhart Glass Veritas sets a new standard for automated inspection that will allow a cost-effective level of quality and production never before possible.

This new family of equipment marks the first time that a comprehensive set of inspection tools has been developed for glass containers. Instead of re-designing or re-working existing inspection machines and technologies, the entire Veritas Series was conceived and designed from a clean sheet of paper.

Veritas encompasses almost every inspection currently

available to the industry, as well as new inspections, some available for the first time in an on-line system. Veritas is Emhart Glass' response to the changing requirements for automated, on-line glass container inspection.

The Veritas iM, introduced in 2002, offers innovations in servo-controlled bottle handling and inspection. The Veritas iB is in the final stages of field testing in the US and Europe and performs top-down inspections of the finish and base. The final module, the Veritas iC, will perform non-contact sidewall aspect, sidewall stress, and dimensional inspection. It begins early prototype testing this year, and is expected to be available by early 2004.

The second in the Veritas series, the Veritas iB consolidates all of the vision inspections currently offered on the Emhart Glass ProScanner 3200, 5200 and 8200 inspection machines and

adds some new ones into a compact belt handler in which all mechanical adjustments are motorised and software-controlled. This enables electronic storage of all setup parameters. Setup on a repeat job can be completed in a few minutes. The inspections offered in the Veritas iB are capable of extremely accurate defect detection with little or no loss of good ware. In recent testing sealing surface inspection was proven capable of detecting flange finish defects as small as 0.081mm and knockout defects as small as 0.135mm with a false reject rate of less than 0.03%.

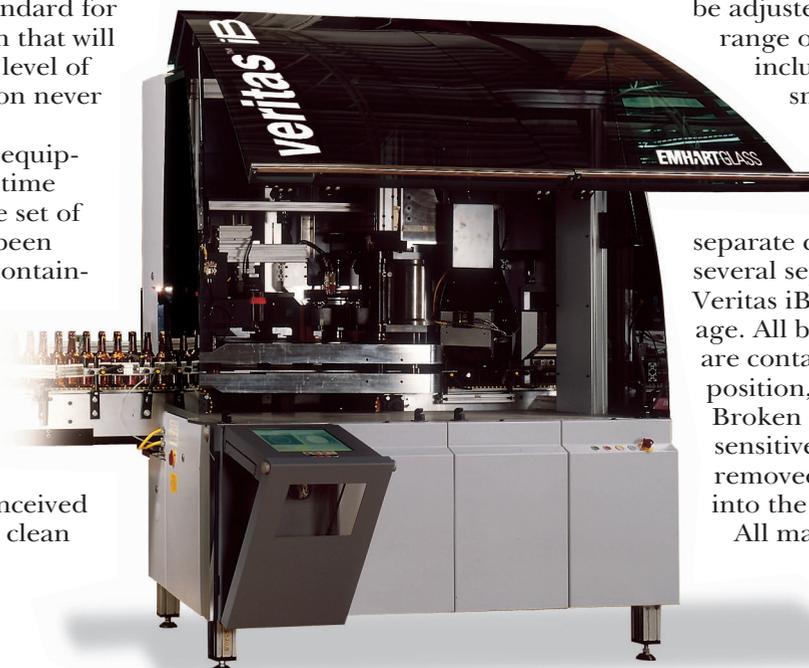
In addition to sealing surface inspection, the Veritas iB also offers base, base stress, vision plug, and vision dip/saddle/height inspection, as well as mould number reading. Mechanically it takes simplicity to a new level.

Two sets of stepper motor-driven belts transport containers through the machine. These can be adjusted to handle a wide range of container shapes, including tapered ware, small ware, and non-

round ware. Unlike other vision inspection systems that use separate light sources, separate cameras and, sometimes, several separate processors, the Veritas iB is designed as a package. All bottom-up light sources are contained in a single, fixed-position, sealed enclosure.

Broken glass simply cannot hurt sensitive optics. It is easily removed and can be deflected into the cullet chute.

All machine wiring is well organised, limiting exposed cabling to an absolute minimum.



Access to all electrical controls is consolidated into an electronics assembly that can be accessed easily by removing a single front panel. All cabling access to the vision modules also is from the front. This virtually eliminates the need to access machine components from the rear of the machine.

Stepper motors also are used to control position of inspection optics. Position settings are programmed in software. Once stored these position settings can be recalled in seconds. When setting up on a repeat job, both position settings and inspection settings can be downloaded to the machine either from system memory or from a network connection. If no changes are required, setup on a repeat job takes five minutes or less.

The Veritas iB also consolidates and re-packages many of the vision inspections.

■ ***Vision mould number reading.*** The camera, located in the sealed optics box below the belt handler, uses an innovative optics design to enable bottom-up mould number reading. This allows it to

read almost all heel and base-embossed mould codes, including digital alphanumeric.

■ ***Vision base and base stress inspection.*** The Veritas iB uses another innovated optics design that allows a single motorised focus/zoom lens and a polarised beam splitter to be used for both inspections. This reduces setup complexity, as well as the need for a separate light source for base stress inspection.

■ ***Vision plug, vision dip/saddle/height.*** Historically, these inspections have been performed with imprecise mechanical go/no-go devices that wore over time and often limited the speed of the host inspection machine. In the Veritas iB, patented vision technology that uses telecentric lensing and combinations of direct and indirect lighting enables precise, measurable inspection at speeds of up to 600 bpm.

The Veritas iB, as well as all Veritas Series modules, uses intuitive touchscreen displays that have a common look and feel and are designed to simplify inspection setup. The selection of

various graphical icon-based inspection algorithms becomes simple, along with other software tool options that may be used for the job setup configurations. The interface makes subsequent changes simpler, which allows for a wide variety of container setups that can be saved and later recalled quickly for job changes. Job changes also are faster, since the software programmable adjustments are automatic. The Veritas user interface also enables secure, remote access through the use of a web browser.

The challenge, then, has been met. Setting a new standard for vision inspection of glass containers, the Veritas iB and soon to be released Veritas iC are the result of intelligent re-thinking of inspection requirements and how they can be applied in complex, yet easy to use, machines. It is called sophistication made simple.



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