



The new 16:9 HMI allows more inspection modules to be displayed side-by-side

PREFORM QUALITY INSPECTION

When it comes to quality inspection of preforms, several questions occur for the producers: Which kind of inspection is the best? How can it be done not only precisely and quickly but also in order to save time, using as few man-hours as possible? And if it will be made by a machine, will this use up much of the valuable floor space?



The PreWatcher III in its updated version including numerous improvements in hardware and software



The two way conveyor provides a safe transportation, optimizing preform closing into the centrifugal feeder

The inspection of preforms is a challenging task and has to be carried out thoroughly. As a preform is an early version of the final product, even very small defects have to be detected as they might become bigger further up the production chain. The challenge for an inspection system is to provide detailed data about the object yet be able to inspect in a comprehensive and objective way without delaying the production. In this regard, there is evidence suggesting that a vision inspection system is the device to choose.

PreWatcher III

The PreWatcher III by the German company Intravis is an inspection system especially designed for inline inspection of preforms. It can be installed either behind an injection moulding machine or before a stretch blow moulding machine. The entire system takes up a footprint of eight square metres. Besides the option to use the PreWatcher III inline, it also can be used for offline inspection in combination with a bunker, tipper and octabin filler.

The PreWatcher III inspects the quality characteristics of up to 72,000 preforms per hour. The orientation mechanism operating with centrifugal force is integrated directly into the system. Additional space-consuming equipment for preform orientation is not required. Eight cameras ensure all areas of the preforms are inspected: Six cameras are responsible for the thread and body inspection while two cameras inspect the top sealing surface and the gate area.

Exhibition at the K-Fair

On this year's K-Fair in Dusseldorf, the new version of the PreWatcher III will be showcased for the first time. The upgrade contains various improvements and optimisations.

“When we introduced the PreWatcher III at the last K-Fair, it was an entirely new type of inspection system,” states Gerd Fuhrmann, managing director of Intravis. “Within the last three years we have gained a lot of experience with the system in the field, allowing us to present an even more elaborate version. Our goal was to refine the system and make it faster and more reliable.” According to this vision, the PreWatcher III has been updated all over and equipped with many hardware and software innovations.

A major improvement is the two way conveyor, which allows for the better feeding of the centrifugal unit and optimises the system for inline use. The centrifugal feeder is always filled in an optimal way resulting in a significantly improved overall performance.

Moreover, the customers can now choose from a wider range of personalisation parts. These have been optimised for a gentler preform transportation just as with outside tapered preforms. To boost this effect, a refined running rail has been installed for a smoother preform transport. A broader variety of preforms is now inspectable, including oil preforms. An easier assembly of the V-guide is possible through a mounting bracket.

Easy body length adjustment

For the lighting setup, a preform jig is installed close to the sealing surface inspection station. It is an optional extension that can be used to determine and adjust the body length setting without having to measure the preform. The body length setting defines the appropriate distance of the camera and lighting unit from the preform for the dome inspection. To do so, the preform simply has to be inserted along, with the support ring, into the slot in the holder on the preform jig.

In addition, some general hardware improvements have been made on the PreWatcher III. These include a new cover for the centrifugal feeding which is more stable and less susceptible to damage; furthermore, noise insulation has been added at the rotation disc ▶

Easy access to the centrifugal feeder: shutters around the housing are easy to open, reducing downtime when exchanging spare parts



Closed shutter



Open shutter

bottom. The transfer guides have been refined for safer transportation, particularly when it comes to larger and outside tapered preforms. All these alterations provide a safer and more stable flow when inspecting at higher speeds.

Another improvement is a new 16:9 monitor with a 21.5-inch display, which makes it easier to observe new inspection modules – as in the future, there will be even more possibilities to inspect preforms. But there is also another need for more display space: As an additional innovation, the PLC, controlling and visualizing the status of the entire system, has been integrated into the self-developed software IntraVision. Now the troubleshooting is easier and settings such as the conveyor belt speed are more comfortable to adjust. The system can also be equipped with two monitors, if necessary.

The cabinet has been redesigned as well as updated, and now allows for the integration of future enhancements. A new and faster computer has also been integrated.

Access with shutters

New shutters with a recess beneath provide an easier access to the centrifugal feeder, resulting in a shorter downtime when exchanging the ring guides. They can easily be opened and removed by simply pulling a lever.

The disc separator is yet another innovation on the PreWatcher III. It is positioned right above the centrifugal feeder, being tied to the middle pillar, and separates sticky preforms from one another. When in use, it leads the preforms to the outer gap quickly where they will fit in. This prevents a tailback of too many preforms in the centrifugal feeder, and small preforms in particular can now be put in order even quicker. This means that even faster inspection of small and light preforms is now possible.

The day-to-day working environment requires a highly flexible inspection system, especially when preforms of a different colour have to be inspected. The new PreWatcher III offers this flexibility with switchable lighting. The standard lighting is white light for transparent or translucent preforms of any colour. For virtually opaque colouring, as is

often used with beer preforms, infrared light is an additional possibility for inspection. Further lighting has been added to support the cavity number reading, enabling the system to read even smaller or inaccurately engraved numbers. In addition, a spectrometer measures the colour deviations of every single preform precisely, including the absorption of infrared and ultraviolet light.

New neck support ring inspection

The PreWatcher III also contains new software: One example is the new inspection module PWN, which inspects the neck support ring of the preform. It does not require any additional hardware equipment and the images taken for the cavity number reading are also used to inspect the neck support ring. Deviations like damages, spillings, notches and bendings are detected, which might otherwise cause greater damage during the production process.

With all these improvements and alterations, the PreWatcher III can be seen as one of the most modern vision inspection systems in the world, supporting the customers' needs in all dimensions. □

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The first version of the PreWatcher III by Intravis was introduced at the K-Fair 2013. It was the first vision inspection system made for inline use that combined a high inspection speed with a very small floor space. The device inspects preforms for criteria like geometrical characteristics such as length and shape deviations, material defects, colour, notches and holes in the gate as well as the sealing surface. It is also the only system on the market that does cavity number reading. On an area of only 86 square feet, the PreWatcher III aligns the preforms gently by centrifugal force, while eight cameras take the images. It has since been continuously developed and is now showcased for the first time, in its upgraded version, at this year's K-fair.

About Intravis

With more than 20 years of experience and almost 200 employees, the German company Intravis GmbH belongs to the worldwide market leaders in vision inspection systems for the plastic packaging industry. The company offers turn-key solutions for the inspection of preforms, closures, bottles and containers, layers and decoration.



Preform jig: The object has to be inserted into the slot to determine and adjust the body length setting