Preform Inspection with Minimum Footprint

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When it comes to quality inspection of preforms, several questions occur for the producers: Which type of inspection is 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 performed by a machine, will this use up much of the valuable floor space?

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 problems 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 strong evidence that a vision inspection system is the equipment to choose.

PREWATCHER III

The PreWatcher III from Intravis is a preform inspection system that can be installed behind an injection molding machine. In contrast to the Intravis Sample-PreWatcher, it is especially designed for inline inspection and inspects 100% of the produced preforms. The entire system takes up a footprint of eight square meters including the preform feeding unit. 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 and is thereby much faster than the Sample-PreWatcher. 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.

The day-to-day working environment requires a highly flexible inspection system, especially when preforms of a different color have to be inspected. The PreWatcher III offers this flexibility with switchable lighting. The standard lighting is white light for transparent or translucent preforms of any color. For virtually opaque coloring, 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 color deviations of every single preform precisely, including the absorption of infrared and ultraviolet light.
At this year’s K-Fair in Dusseldorf, a new version of the PreWatcher III will be showcased for the first time. The upgrades include several hardware and software innovations.

One major improvement is the two way conveyor, which allows for better feeding of the centrifugal unit and optimizes 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 personalization parts. These have been optimized for an even gentler preform transportation just as with outside tapered preforms. To boost this effect, a refined running rail has been installed for a smoother preform transportation. A broader variety of preforms is now inspectable, including oil preforms. An easier assembly of the V-guide for downstream direction of inspected products is possible through a mounting bracket.

Another improvement is a new 16:9 monitor with a 21.5-inch display, which makes it easier to observe current and new inspection modules – as in the future, there will be even more possibilities to inspect preforms. As an additional innovation, the PLC, controlling and visualizing the status of the entire system, has been integrated into the inhouse developed software IntraVision. Now the personalization 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.

In addition, some general hardware improvements have been made on the PreWatcher III. These include a new cover for the centrifugal feeding unit which is more stable. Furthermore, noise reduction material has been added at the rotation disc bottom. The transfer guides have been refined for safer transportation, particularly when it comes to larger and outside tapered preforms. All these modifications provide a safer and more stable flow when inspecting at higher speeds.

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. Small and light preforms in particular can now be arranged quicker, resulting in even faster inspection.

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NEW NECK SUPPORT RING INSPECTION

The PreWatcher III also contains a refined version of a software module for the inspection of the neck support ring. By its new approach using Artificial Intelligence, it can identify even those defect types characterized by sharp edges which can injure the user of the later bottle. Those defects can be tiny and only visible from the side, however the new technology detects all of them.

With all these improvements and modifications, the PreWatcher III can be seen as one of the most modern vision inspection system in the world, supporting the customers’ needs in all areas.