

APPLICATION NOTE AN010

HDPE Blow Molding

PACKAGING

INDUSTRY: Packaging

APPLICATION: In-line blow molding opacity verification

The Challenge

One of the important factors in bottle use is the light barrier that the bottle provides to its contents. Since HDPE is a naturally translucent material, pigments are added to create the necessary opacity for the container. The most popular pigment is titanium dioxide, which provides excellent opacity and white coloring. During the manufacturing process it is important to maintain the required quantity of the pigments to achieve the proper opacity acceptable to the customer while protecting the contents from the damaging affects of light.

Failure of delivering the bottle with the required opacity can be costly and result in rejected shipments or spoiled contents, leading to much worse implications. However, too much of the pigment is a costly proposition as well.

The Solution

EMX industries, Inc has developed the OPAX in-line sensor, providing a solution for both problems. The OPAX is positioned above the conveyor where finished bottles are transported. Each bottle is evaluated on the fly for its opacity, at the rate of 6000 times per second by the OPAX sensor. Bottles that fail the opacity test can be ejected from the conveyor by a pneumatic arm. In addition, the OPAX provides continuous data about the opacity of each bottle. This information can be fed into the system and the pigment can be adjusted to obtain the optimal opacity.



The photo shows the sensor measuring the opacity of a typical container. The sensor outputs the measurement result to the control system. The integration of the OPAX sensor in bottle blow molding operations ensures that there will be no bottle with insufficient opacity. As an added benefit the use of pigments can be optimized, eliminating waste.

The photo shows the OPAX opacity system. The sensor features a 2-digit display indicating the signal level measured by the sensor. A modulated light source prevents the sensor from being affected by ambient light. Calibration and light source intensity adjustments are provided to allow the sensor to operate efficiently over a wide range of container opacities and distances. A remote lock feature prevents unauthorized changes to the sensor settings.



Equipment Required

[OPAX](#)

On-line opacity measurement system



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