



Industry:

Food and Beverage



Applications:

Gable-top sealing; Heat or pressure sealing; In-line forming, filling, sealing of gable-top cartons



Problem:

Proper sealing of gable-top cartons is critical to prevent spillage and spoilage. At best, improperly sealed cartons lead to wasted product and added machine cleaning costs. At worst, spoiled product in the supply chain leads to loss of consumer confidence, product recalls and possible litigation. To ensure that each and every gable-top carton is properly sealed, it is essential that each carton undergo thorough seal inspection.



Omron "FACTS" Advantage

- 2 ZX Laser Measurement Sensors with laser sensing heads
- 1 ZX CAL Calculating Unit
- 1 E3X "trigger" sensor

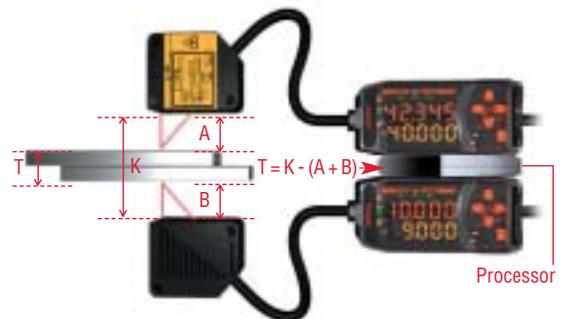
Ensure consistent gable-top sealing integrity with 100% inspection by combining two Omron ZX laser measurement sensors with the ZX calculating unit for a simple, reliable and consistent inspection system. High-speed processing, built-in High/Low/Pass control outputs, choice of laser sensor heads and available monitoring software enable quick deployments, simpler control architectures and 100%, in-line inspection that keeps up with your production process.



Application Diagrams



Insufficient glue or sealer mechanism out of adjustment



T = Thickness K = Constant (Programmable)
A = Distance 1 B = Distance 2

Figure #1
ZX Calculating Unit

Gable-Top Carton Inspection Application Details

Issue

The integrity of the gable-top carton seal is very important in the food and beverage industry. It ensures quality and production efficiency, which are critical factors for food manufacturers. Automatic, semi-automatic and manual filling/sealing machines must be able to produce high quality seals in order to ensure and maintain product quality. Bad seals can result in wasted product, costly supply chain recalls and loss of consumer confidence in the brand. To prevent these problems as well as long-term profit loss, food packagers must conduct 100% inspection and reliably detect defective gable-top seals in-line, without compromising full line speeds.

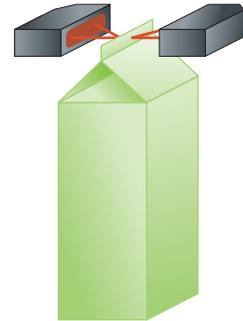
Cause

Improperly sealed gable-top cartons are most often the result of misalignment of the sealing mechanism, but can also be caused from:

- Insufficient glue
- Damaged cartons
- No glue
- Sealer mechanism out of adjustment

Properly sealed gable-top cartons will be of uniform thickness with flush end-to-end alignment. Improperly sealed cartons are characterized by variable thickness of the sealed edge, or edges that are uneven, open, torn or bent.

Simple and reliable automatic inspection systems for gable-top carton sealing has proved difficult for non-contact approaches because the paperboard used in the carton is only semi rigid and exits the sealing process in a non-uniform way. This makes it difficult to get reliable results using only a single point of inspection.



Omron's Unique Solution

By placing two Omron ZX laser measurement sensors in opposing positions and using the available ZX-CAL calculating unit, packaging engineers can establish reliable thickness measurements of gable-top carton seals regardless of the position of the gable-top in the sensing field.

In this control strategy, the output of the two sensors is arithmetically compared in the calculation unit and thickness of the top is displayed on the amplifier. (See figure #1 on front page). The ZX sensor's peak hold function is used to determine the maximum thickness of the gable-top. Too great of a measured thickness will indicate an improperly sealed carton. In this way sensors can quickly determine whether the seal is of uniform thickness and whether the ends are properly flush. An Omron E3X fiber optic sensor is used as a "trigger" sensor to start and stop the inspection cycle at the leading and trailing edge of the carton.

Built-in High/Low/Pass control outputs of the ZX sensor enable the engineer to directly control a gate to direct defective product off line. With the inspection system outside of the primary control loop, setup and operation is quick and able to easily keep up with high-speed production lines.

The available sensor monitoring software provides graphic views of the inspection system and easy data logging and trending that can help identify problems upstream and eliminate them before they cause defective packaging.



Results

The unique characteristics of the ZX sensor solution (with quick-connect calculating unit and built-in control outputs) ensure 100% product inspection and virtually eliminate spillage and spoilage of products in improperly sealed gable-top containers. The elegant solution is simple, quick to deploy, reliable and accurate - no matter where the target is in the sensing field. In addition, the ZX sensor monitoring software enables easy system setup and real-time monitoring of results.

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