

FILL LEVEL INSPECTION IN 2-PIECE METAL CANS

Tested: 2 Piece Metal Cans

Tested with: TapTone 1000-X Fill Level Inspection System

The purpose of the evaluation was to prove the effectiveness of the TapTone X-ray sensor in determination of proper fill level in steel food cans, prior to retort. Packagers in the food and beverage industry employ fill level inspection in order to ensure that containers are properly filled. With the system installed prior to the cooker, fill level related defects can be eliminated early in the manufacturing process. The system is capable of detecting changes in fill height as small as 0.5-3.0 mm



TapTone 1000 Controller

How It Works

The TapTone X-ray sensor is a non-contact container inspection module, cantilevered over the customer's existing conveyor. The X-ray sensor utilizes X-ray technology to measure fill level of products in steel, aluminum, glass, plastic or paper containers. An X-ray tube is used to produce a low energy X-ray beam. This X-ray beam penetrates the side of the container in the expected area of the fill level. An X-ray detector is positioned on the opposite side of the container to measure the intensity of the beam after it goes through the container. The intensity of the beam is then compared to acceptable energy levels to determine

the relative fill level of each container and a merit value for the fill level is assigned by the Digital Signal Processor (DSP) board. The X-ray sensor can be used to measure both overfilled and underfilled products in all types of containers.

High and low reject limits are defined by the user. Rejection limits may also be adjusted to account for changes on the processing line such as product movement caused by changes to the line speed. Containers falling outside the user-set acceptance criteria are rejected.

See next page for test results

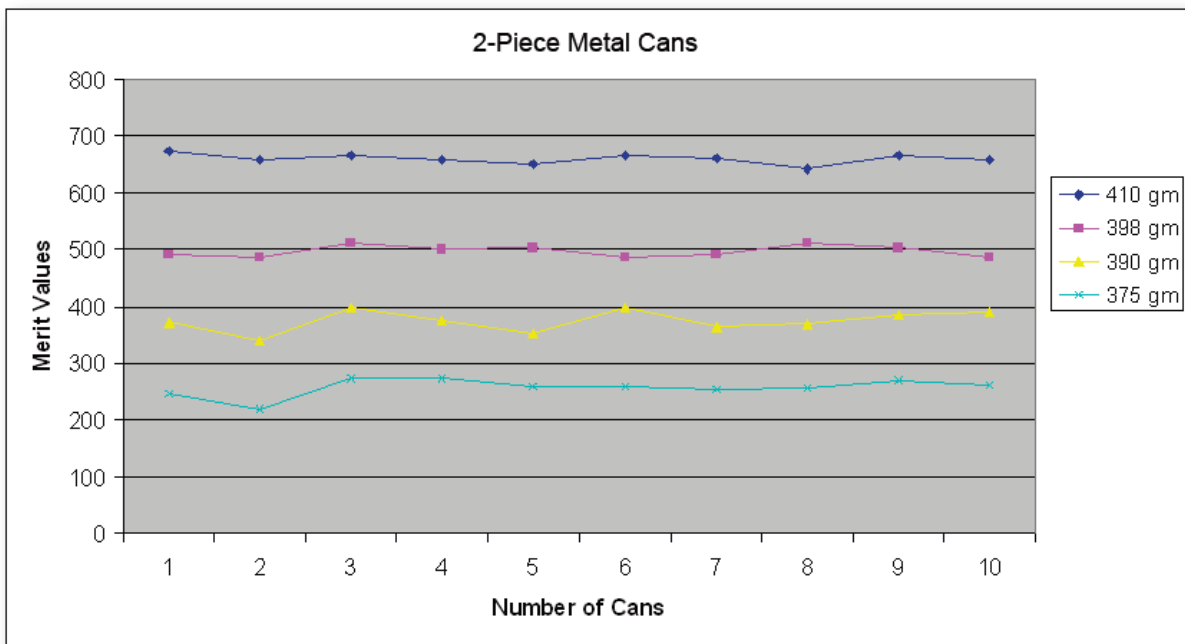
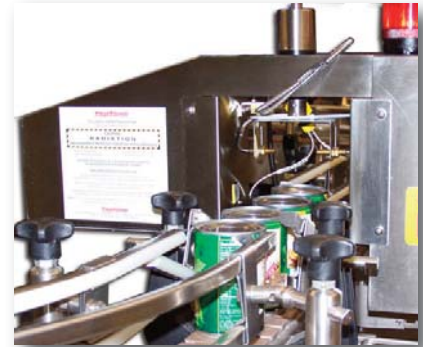


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TEST

A set of cans with varying fill heights were created. To differentiate between containers, the weight in grams was determined for each can. Container weights ranged from 375 – 410 grams. The cans were passed through the TapTone X-ray sensor, and the merit values were collected. The merit values for the fill height inspection are directly proportional to the fill height in the container; the higher the merit value, the greater the fill level. As observed in the graph below, the merit values allow the user to clearly distinguish between fill heights of containers.



*Merit value is a calculated number determined using an algorithm to compute a resultant from a set of data values.

Note: The X-ray sensor has routinely been used to detect changes in vertical fill height of 0.5 – 3.0 mm (0.02 -0.12 inches). This can translate to a detection of fill weight variances of as little as one gram, depending upon container dimensions and material.

SUMMARY

The results indicate that the TapTone X-ray sensor can successfully be used to detect fill-level variations in 2-piece metal cans.



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