TapTone
PACKAGE INSPECTION

Application Note of the Week

November 24, 2003

Seal integrity, pressure/ vacuum loss and fill level inspection in EZ open soup cans (cooker protection)

Tested: **2-piece EZ open soup cans**
Tested with: **TapTone 500-PX Proximity/X-Ray Inspection System**

The purpose of this test was to prove the effectiveness of TapTone systems in determining seal integrity, proper vacuum and fill level in EZ open soup cans prior to retort.

Packagers in the food and beverage industry have long sought a remedy for the costly equipment failure and downtime that results when defective containers jam the continuous cooker on a canning line. By combining a proximity sensor to measure lid curvature and an x-ray fill level sensor, the TapTone T500-PX detects and automatically rejects cans with deflective lids, flat lids, missing lids, cocked lids, seam defects, knockdown flanges, dents, underfill and overfill, and low vacuum. With a TapTone system installed before the cooker, these defects are virtually eliminated, protecting the cooker from jam-ups.

TapTone 500-PX – How it works

The TapTone 500-PX uses a proximity sensor to measure pressure or vacuum in food cans, beverage cans, glass jars, or bottles with pop-up lids by measuring lid deflection. The proximity sensor produces a continuous magnetic field that monitors the distance of the metal lid and produces a proportional analog voltage. The continuous proximity signal is digitally sampled to produce a merit value of the lid profile. The profile value is then compared to user set limits where containers with lid deflection outside these limits are rejected.

The x-ray sensor utilizes x-ray technology to measure the fill level of products packaged in steel, aluminum, glass, plastic or paper containers. An x-ray tube energized at high voltage is used to produce a low energy x-ray beam. This x-ray beam is focused to look through the container in the expected fill level region. As the x-ray beam penetrates the container, it is attenuated by the amount of product blocking the beam. The beam is monitored by an x-ray detector which measures the x-ray intensity after it goes through the container. The change of intensity is directly proportional to the fill level of the container. Rejection levels, set by the user, define the high and low level limits.

▲ *EZ open soup cans are tested with the T500-P.*

▲ *TapTone 500-P*

▲ *TapTone 500 smart x-ray sensor*

See next two pages for test results.

TapTone
Division of Benthos, Inc.
49 Edgerton Drive
North Falmouth, MA 02556 USA
Tel: 508 563-5920 Fax: 508 564-9945
E-mail: info@taptone.com
www.taptone.com

TapTone
PACKAGE INSPECTION

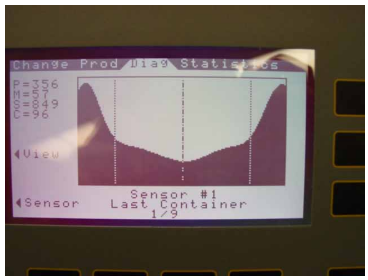
Application Note of the Week

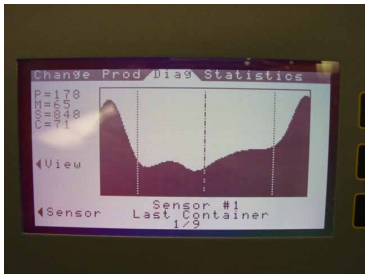
November 24, 2003

Test 1 – TapTone 500 Proximity Sensor

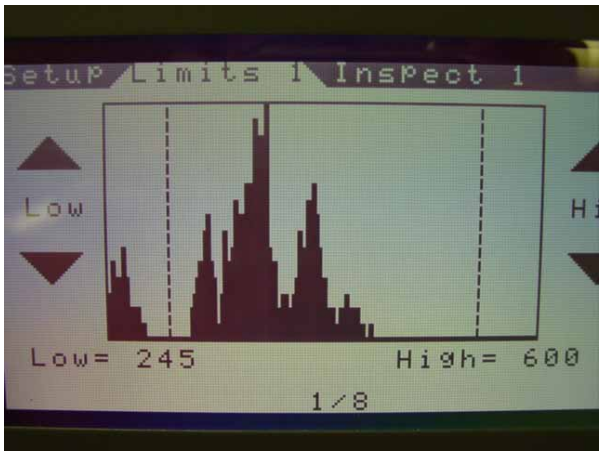
The cans were tested both right side up and upside down. The tests proved that a clear low/ high value separation of properly sealed containers versus defects was achievable.

Can Tops





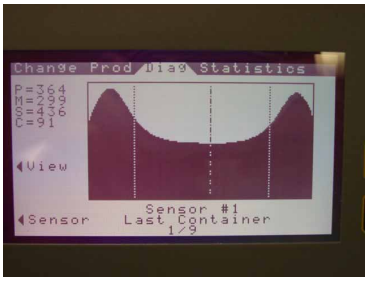
▲ *Top: good can profile. Bottom: bad can profile.*

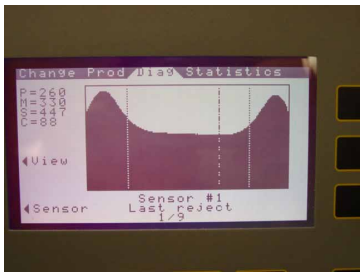


▲ *Screen capture shows the profile histogram of the top ends of the cans tested single file with the T500-P. The data plot displays the separation of a sealed cans versus those with low vacuum.*

Can Bottoms

▲ *Screen capture shows the profile histogram of the bottom ends of the cans tested single file with the T500-P. The data plot displays the separation of a sealed cans versus those with low vacuum.*





▲ *Top: good can profile. Bottom: bad can profile.*

TapTone
Division of Benthos, Inc.
49 Edgerton Drive
North Falmouth, MA 02556 USA
Tel: 508 563-5920 Fax: 508 564-9945
E-mail: info@taptone.com
www.taptone.com

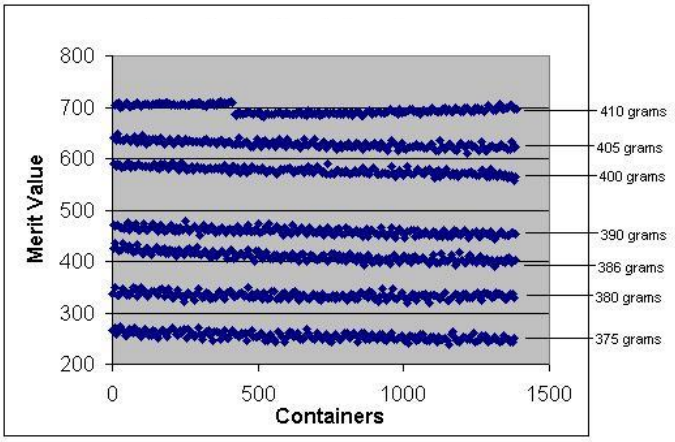
Application Note of the Week

November 24, 2003

TapTone 500 X-Ray Sensor

Cans were then passed through the TapTone 500 smart x-ray sensor. As seen in the histogram, the merit values clearly distinguish weight variations in the cans.

▲ *Cans are tested with the T500 x-ray sensor.*



▲ *Histogram shows weight variations in the cans.*

Conclusion

Both tests successfully show that EZ open soup cans will be tested effectively for seal integrity, vacuum level and fill height prior to entering the cooker and thereby preventing jams.

TapTone
Division of Benthos, Inc.
49 Edgerton Drive
North Falmouth, MA 02556 USA
Tel: 508 563-5920 Fax: 508 564-9945
E-mail: info@taptone.com
www.taptone.com