TELEDYNE TAPTONE
Everywhereyoulook™

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TapTone APPLICATION NOTES

News and information from Teledyne TapTone, a leader in the package inspection industry.

Leak Detection in Beverage Cans

Tested: Two-piece 12oz (355ml) carbonated beer cans; CO2 or LN2 Dosed with 202 can end.

Inspection Desired: Leak detection

Tested with: TapTone T4000 FS

The purpose of this test is to prove the effectiveness of the TapTone T4000-FS in testing carbonated and LN2 dosed beverage cans for pressure loss and leak detection. Cans are manufactured today using less raw material in an effort to decrease manufacturing and shipping costs. The reduction in materials, referred to as light-weighting or thin walling, renders them more susceptible to damage and leaks at production speed with damage due to twists and conveyor side rails. Traditionally, these cans have been tested with fill level or proximity systems. Fill level testing is only capable of detecting gross leaks and proximity testing is less accurate at pressure detection.

The challenge with Proximity inspection is that the can end retains some of its expanded (pressurized) shape even when the pressure has been lost, and since proximity testing relies on measurement of the can end's shape (lid deflection) it may not be rejected. Therefore, pressure resolution (10-12 psi for the proximity sytem) remains the major shortfall for a standalone proximity sensor, whereas the resolution of force technology is capable of pressure detection to within 1-2 psi. Proximity inspection is best suited for lid deflection measurement for gross

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TECHNOLOGY CORNER *How it works*

The patented Force technology of the TapTone T4000 FS system detects leaks and low pressure in aerosol containers, LN2 dosed beverage containers, and carbonated beverage containers. Parallel belts transport the container past a sensor that measures the tension on the sidewall of the container. This action allows the system to accurately measure the pressure inside the container. Utilizing DSP technology, the controller analyzes the measurement and assigns a relative merit value to each container based on internal pressure of the can. If the merit value is outside of the acceptable range, a reject signal activates a remote reject system to remove that can from the line.

TapTone T4000-FS

leak inspections as a "dud" detector for beverage cans, but will not provide linear data with pressure changes compared to the resolution of Force inspection.

Proximity Technology is a measurement of lid deflection and is not linear with pressure change. Expected lid deflection resolution is 0.010" – 0.015" (10psi – 12psi) of typical pressure change from "good" pressure to lost pressure.

Proximity Technology will detect:

- upside down cans
- missing pull-tabs
- zero pressure cans
- buckled lids

Force Technology is a pressure measurement and is linear with pressure changes. It is used to accurately measure internal pressure in beverage cans.

Expected resolution is (0.5 – 1.5 psi for LN2) and (1.0 – 3.0 psi for CO2) products depending on the total pressure range. Force technology tests the sidewall of the container, which has proven to be a more sensitive and more reliable method of accurate pressure measurement for cans.

Force Technology will not detect

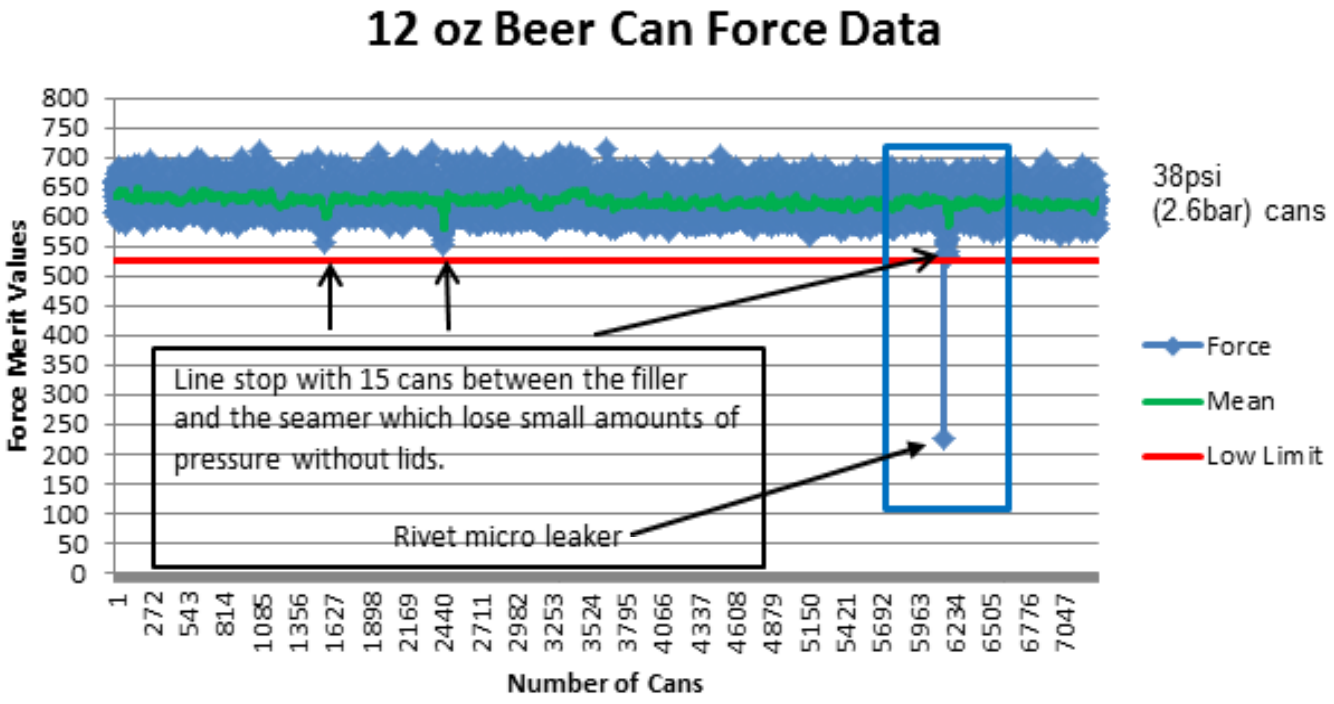
- upside down cans, missing pull-tabs, buckled lids but will be much more accurate at pressure detection.

The benefit to adding a proximity sensor to a force system is the added identification of missing pull tabs, upside down cans, or buckled lids.

The TapTone T4000 FS system is capable of detecting leaks and low pressure in both carbonated, and LN2 dosed beverage can applications. The T4000 FS offers reliable leak inspection to maintain strict quality control by identifying low pressure, leaking or zero pressure containers before reaching the consumer.

Testing Overview

In this test, the T4000 FS was installed post pasteurizer on a brewery line after the fill level inspection system to identify leakers missed by the fill level inspection system. Most leakers detected were the result of rivet or score defects where fill levels were still in the passable range but internal pressure had dropped below acceptable limits.



Summary

Testing was successful post pasteurizer with the T4000-FS placed in-line demonstrating consistent leak detection with 202 can ends.

T4000 FS Advantages:

- Line speeds up to 2000 cans per minute.
- Cans are inspected for leaks in the upright position eliminating the need for can inverting.
- Detects leakers caused by defective can seams, lid scores and pull-tab rivets.
- Pressure measurements provide valuable feedback to monitoring the filling and/or dosing process.
- Available FS Beverage version is designed to meet conveyor heights up to 77" offering easy installation and clearance under conveyors with fewer cables.

T4000 FS Benefits:

- Expandable system: Upside down cans, missing pull tabs, and bulged or buckled lids by adding a proximity sensor
- Patented pressure measurement technology with auto-tracking limits.
- High reliability, low maintenance, easy change-over
- NEMA-4X (IP65) Rated, UL, CUL, CE Approved.
- Cantilevered frame design means easy installation with no line modifications.
- Ethernet Interface Port.

TapTone T4000-FS

TapTone T4000-FSB

Cans being tested in TapTone T4000-FSB

Test results achieved in the test laboratory may be different from results seen in the production environment.

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