



# TapTone

## APPLICATION NOTES

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

### LEAK DETECTION ON PLASTIC SINGLE SERVE DAIRY CONTAINERS

**Tested:** Plastic Milk Chug Containers, 14 oz

**Inspection Desired:** The purpose of the evaluation was to prove the effectiveness of the T4000 Dual Sensor Compression system for detecting small leaks in single serve dairy containers. The dairy industry has various methods for processing and packaging milk. Different heat treatment methods such as Pasteurization, Ultra High Temperature (UHT), and Sterilization can give single serve milk products a shelf life ranging from 4-7 days at <8 degrees Celsius (45 degrees F) to 6-9 months at ambient temperature. Ensuring the container is properly sealed is critical, particularly for products with a longer shelf life. The T4000 DSC is capable of detecting leaks as small as .006" (.152mm) at production speeds up to 250 feet/min, (1.27 meters/sec).

**Tested with:** TapTone 4000 Dual Sensor Compression System



▲ HDPE Milk Chug Containers

### TECHNOLOGY CORNER *HOW IT WORKS*

The T4000-Dual Sensor Compression system finds and rejects leaking and damaged flexible bottles at production line speeds up to 300 feet per minute. The system is designed with dual parallel belts suspended over the customers' existing conveying system. As the container passes through the system, the dual parallel belts apply force to the sidewall of the container. This action compresses the headspace of the container which allows a comparative measurement to be taken at both the infeed and the discharge of the system. Comparing the container to itself between the infeed and discharge of the system, eliminates typical variations seen in the production environment (Fill Level, Product Temperature, and Container Density).

Utilizing advanced DSP technology the T4000 controller analyzes the comparative measurement and assigns a merit value to each container. If the merit value is outside of the acceptable range, a reject signal activates a remote reject system.



▲ T4000-DSC (Dual Compression System)



## TEST

Testing was done on 14oz HDPE single serve dairy containers. Good, non-leaking containers were passed through the system multiple times to establish Entry, Exit, and Leak merit values for non-leaking containers. The average leak merit value for a good container was found to be 858.

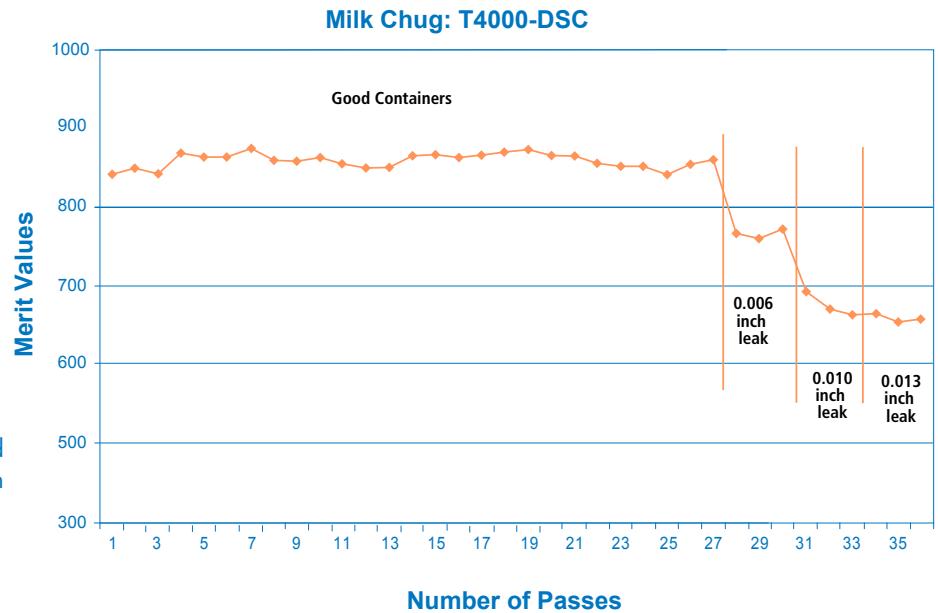
To create a leaking container, the cap was removed from a good container and replaced with calibrated orifices of varying sizes. A container with a .006" (.152mm) calibrated leak orifice was tested multiple times. The average merit value for the 0.006" (.152mm) leak was 766. This was 92 merit value points below the good, non-leaking container. The average merit value for the 0.010" (.254mm) leak was 675. This was 183 merit value points below the good, non-leaking container. The average merit value for the 0.013" (.330mm) leak was 659. This was 199 merit value points below the good, non-leaking container.

The graph below shows the T4000-DSC is able to clearly distinguish between good containers and containers with a .006" (.152mm) leak at production speeds of 100ft/min (.52m/sec).

## SUMMARY

The results show that the T4000-DSC system can successfully detect leaks as small as .006" (.152mm) in HDPE milk containers at full production speeds.

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



49 Edgerton Drive • North Falmouth, MA 02556 USA

P: +1 508.563.1000

F: +1 508.564.9945

E-Mail: [taptone@teledyne.com](mailto:taptone@teledyne.com)

10/18/11. Specifications subject to change without notice.

TapTone is a registered trademark of Teledyne TapTone. Copyright 2009, Teledyne TapTone.