



TapTone

APPLICATION NOTES

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

Leak detection in a household chemical container

Tested: Flexible plastic household chemical container with plastic twist-top closure

Tested with: TapTone 4000-C Compression Sensor

The purpose of this test was to prove the effectiveness of the TapTone 4000-C Compression Sensor in testing plastic household chemical bottles for proper closure and seal defects. Due to the nature of liquid household chemicals, processors are aware that one leaking container can ruin an entire case of product. Detecting leaking containers just outside the capper also prevents downstream equipment from being contaminated with leaking product. The T4000-C Compression Sensor is ideal for finding potential leakers in household chemical containers before they leave the processing plant.



▲ A bottle of fabric softener passes through the compression belts of the T4000-C.

TECHNOLOGY CORNER *How it works*

The T4000-C Compression Sensor utilizes dual parallel belts to apply force to the sidewall of a passing container. This action also compresses the headspace of the container which allows a sensor to take a pressure measurement at the discharge of the system. Utilizing DSP technology, the controller analyzes the 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.



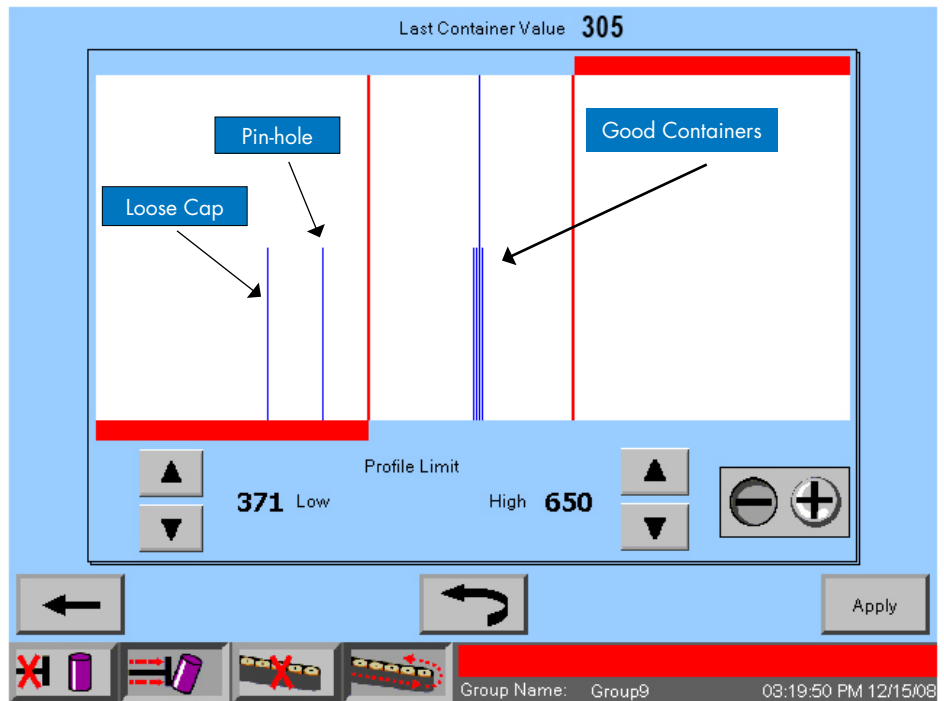
▲ T-4000 Controller and Compression Sensor. Sensor has a cantilever design that suspends over the existing conveyor.



TEST

This evaluation compared non-leaking containers to containers with leaks. The leaking containers were created by loosening the cap slightly or by making a small pin-sized hole (approximately 0.5 mm or .020 in) in the upper shoulder of the container. Containers were oriented to pass through the compression belts with the front and back of the bottle against the belt, allowing for a wider surface area against the compression sensor.

During the compression cycle the sealed, non-leaking containers generated an average merit value* of 500. When the leaking containers were introduced (A and B), merit values were 305 and 330 respectively. A clear separation between good and leaking containers could be identified.



The test line speed was set at approximately 150 containers/minute, to emulate the actual process line speed. * Merit value is a calculated number determined using an algorithm to compute a resultant from a set of data values.

SUMMARY

The test shows that the TapTone 4000-C Compression Sensor can successfully detect leaks as small as 0.5 mm (.020 inches) in flexible plastic household chemical containers.



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