

**NOTE #09-13**

## Visual Vacuum Bubble Leak Testing or Bubble Emission Testing

### SCOPE

This application note covers leak testing method of visual vacuum bubble leak testing for use on product and food packaging that contains some headspace gas. This may also be referred to as bubble emission testing when packaging is immersed under water under atmospheric conditions.

### BACKGROUND

The bubble emission test is used to determine package integrity. Issues such as packaging material compatibility, sealing machine setup and seal reliability are crucial for high altitude trucking and airfreight shipments. Package integrity is also crucial to consumer safety since heat sealed packages are designed to provide a contamination free and sterile environment to the product.

Leak testing by bubble emission can be a destructive testing method and just like with dye penetration, manufacturers should expect to waste a certain amount of package material and products. Leak testing by bubble emission involves submerging the package underwater and looking for leaks. With the proper equipment, vacuum can also be used to reduce the external pressure on the sealed package, giving sufficient internal pressure to allow air or gas to leak out from a defect creating a stream of bubbles.

### DESCRIPTION

Vacuum bubble emission testing is performed by filling a test vacuum chamber with water so that the package is submerged by water. The chamber lid is then closed and vacuum is applied. Vacuum is slowly increased so the package expands. The package is observed for a steady progression of bubbles from the flexible container indicating a leak. Once the vacuum is released the package is also inspected for the presence of test fluid inside the specimen. Flexible packing with little or no head space cannot be reliably evaluated with this test method. Parameters such as the vacuum level during test and the testing time will vary based on the various types of packaging methods and requirements.

### BENEFITS

A bubble emission leak testing system will allow users to accurately setup packaging lines that are reliable and minimize downtime.

### RELATED PRODUCTS

Laco Technologies offers a range of cylindrical and cube style, all clear acrylic vacuum chambers that are ideal for visual leak testing methods. LACO can customize a system with all necessary components for vacuum bubble leak testing.

## RELATED PRODUCTS (CONTINUED)

- Vertical Clear (VC) Vacuum Chambers
- Horizontal Clear (HC) Vacuum Chambers
- Cube Clear (CC) Vacuum Chambers

## REFERENCES

- ASTM D 3078-02: Standard Leak Test Method for Determination of Leaks in Flexible Packaging by Bubble Emission.
- ASTM F2096 – 04: Standard Test Method for Detecting Gross Leaks in Medical Packaging by Internal Pressurization (Bubble Test)
- ISO 11607 “Packaging for terminally sterilized medical devices”
- ASTM E 515-05: Test Methods for Leaks Using Bubble Emission Techniques
- ASTM Designation: Definition of Terms Related to Leak Testing