Designation: D3078 – 02(Reapproved 2008)ε1

Standard Test Method for Determination of Leaks in Flexible Packaging by Bubble Emission[1]

This standard is issued under the fixed designation D3078; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

ε[1] NOTE—The research report footnote was added to the Precision and Bias section in July 2010.

1. Scope

1.1 This test method covers the determination of gross leaks in flexible packaging containing a headspace gas. Test sensitivity is limited to 1×10^{-5} atm cm^3/s (1×10^{-6} Pa m^3/s) or even less sensitive as indicated in a recent interlaboratory test (reported in Section 12).

1.2 Small leaks may not be detected by this procedure. Viscoelastic effects on the products, or entrapped air, become significant and prevent passage through small openings. Positive pressure inside the pouch after the vacuum is drawn may force the product to plug small leaks. The size of the leak that can be detected is dependent upon the products contained, the nature of the packaging material, and the test parameters selected.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E425 Definitions of Terms Relating to Leak Testing (Withdrawn 1991)[3]

E515 Practice for Leaks Using Bubble Emission Techniques

F98 Recommended Practice for Determining Hermeticity of Electron Devices by aBubble Test (Withdrawn 1990)[3]

3. Terminology

3.1 *Definitions:*

3.1.1 *leak*—any opening in a flexible package that, contrary to intention, either allows the contents to escape or substances to enter.

4. Apparatus

4.1 *Vacuum Chamber*—Any transparent container capable of withstanding approximately one atmosphere pressure differential, fitted with a vacuum-tight cover. A vacuum gage, an inlet tube from a source of vacuum, and an outlet tube to the atmosphere shall be connected to the chamber cover. The inlet and outlet tubes shall be equipped with hand valves. Attached to the underside of the cover shall be a transparent plate that will closely approximate the inside dimensions of the container and be such a distance from the top of the container that when it is two-thirds filled with fluid, the attached plate will be positioned 1 in. (25 mm) under the fluid.

5. Materials

5.1 *Immersion Fluids*—Use an immersion fluid which does not degrade the package being tested. Fluids with a low surface tension are generally more sensitive. Examples include water, water treated with a wetting agent, denatured alcohol, and mineral oil. Other possible fluids are listed in Test Method E515 and Practices F98.

6. Sampling

6.1 The number of specimens used in the test sample may be varied according to the nature of the product, its cost, its

[1] This test method is under the jurisdiction of ASTM Committee F02 on Flexible Barrier Packaging and is the direct responsibility of Subcommittee F02.40 on Package Integrity.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.