



Designation: D 3078 – 02

Standard Test Method for Determination of Leaks in Flexible Packaging by Bubble Emission¹

This standard is issued under the fixed designation D 3078; 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.

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 cm³/s (1×10^{-6} Pa m³/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 *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

E 425 Definitions of Terms Related to Leak Testing³

E 515 Test Method for Leaks Using Bubble Emission Techniques

F 98 Practices for Determining Hermeticity of Electron Devices by a Bubble Test³

¹ This test method is under the jurisdiction of ASTM Committee F02 on Flexible Barrier Materials 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³ Withdrawn.

3. Terminology

3.1 *Definition:*

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 E 515 and Practices F 98.

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 size, and whether the specimens are taken from a production line in a normal packaging operation, or are few in number, or are to be used only for purposes of comparative evaluation of procedures or materials.

7. Test Specimen

7.1 *Flexible Package*, with or without its intended contents.