



Standard Test Methods for Internal Pressurization Failure Resistance of Unrestrained Packages¹

This standard is issued under the fixed designation F1140/F1140M; 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.

1. Scope

1.1 These test methods explain the procedure for determining the ability of packages to withstand internal pressurization.

1.2 The burst test increasingly pressurizes the package until the package fails.

1.3 The creep test maintains a specified pressure for a specified time or until the package fails.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.5 *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

E171 Practice for Conditioning and Testing Flexible Barrier Packaging

F17 Terminology Relating to Flexible Barrier Packaging

F88 Test Method for Seal Strength of Flexible Barrier Materials

3. Terminology

3.1 *Definitions*—For definitions and terms used in this test method, refer to Terminology **F17** for standardized terminology for flexible barrier packaging.

¹ These test methods are under the jurisdiction of ASTM Committee **F02** on Flexible Barrier Packaging and are the direct responsibility of Subcommittee **F02.20** on Physical Properties.

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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.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *package failure*—refers to rupture of seal or material.

3.2.2 *restraint*—a mechanism that prevents package movement during inflation.

4. Summary of Test Method

4.1 *Test Method A (Burst Test)*—Packages are tested in an apparatus that internally pressurizes the package until the package fails. The pneumatic supply and pressurization equipment need the capability to maintain an increasing pressure until the package bursts. The test measure is the maximum pressure detected before the package fails.

4.2 *Test Method B₁ (Creep Test)*—Packages are tested in apparatus that internally pressurizes the package to a specified pressure and maintains that internal package pressure for a specific time. The test measure is pass/fail.

4.3 *Test Method B₂ (Creep to Failure)*—Packages are creep-tested and held until the package fails. Test setup is similar to that of the Creep Test except the pressure setting will need to be higher to ensure the package fails in a reasonable amount of time (that is, about 15 s). The test measure is the time until failure.

5. Significance and Use

5.1 These test methods provide a rapid means of evaluating tendencies for package failure when the package is exposed to a pressure differential. Pressure differentials may occur during processes such as sterilization and transportation.

5.2 These test methods are frequently used to quickly evaluate packages during the manufacturing process and at various stages of the package's life cycle.

5.3 If correlations between pieces of test equipment are to be made, it is important that all parameters of the test method be exactly the same. Typical parameters may include, but are not limited to, package size, material, seal configuration, test equipment, rate of air flow into the package, sensitivity (machine response to pressure drop), and position of test article (see **Fig. 1**).

5.4 These test methods do not necessarily provide correlation with actual package seal strength as typically measured using Test Method **F88** (or equivalent).