



Standard Test Method for Burst Testing of Flexible Package Seals Using Internal Air Pressurization Within Restraining Plates¹

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1. Scope

1.1 These test methods cover the procedure for determining the minimum burst strength of a seal placed around the perimeter of a flexible package as it is internally pressurized and enclosed within restraining plates.

1.2 The test methods described herein are functionally similar to Test Methods F 1140 with the exception of the use of restraining plates. Test Methods F 1140 describes methods of burst testing that do not include the use of restraining plates and are suitable to determine a packages general ability to withstand pressurization stresses. Under Test Methods F 1140 the stresses are not distributed uniformly to all areas of the package seal. Under unrestrained conditions the stress on the package is highest at the middle of the pouch where it inflates to the packages maximum diameter; therefore, Test Methods F 1140 may not reliably detect the weakest area of the seal.

1.3 The burst test internally and increasingly pressurizes a package until an area of the package seal around the perimeter “bursts” open in response to pressurization. By placing the package within restraining plates during pressurization, the dimensional stability of the package is maintained in a manner that results in stresses applied more uniformly along the perimeter of the package, where seals are normally placed. This allows the test to have a higher probability of detecting the weakest area of the seal and provide a measurement of the pressure required to “burst” open the package.

1.4 This test only applies to flexible packages with seals placed around the perimeter of a flexible package (often referred to as a pouch). In particular it is intended as applicable to packages with seals that have a peelable seal feature (peeled open by end user to remove contents of package).

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.* Particular caution is advised where users of this procedure may be required to design and fabricate restraining plate fixtures. Reference Appendix X3 for further information regarding calculation of

stress factors and structural design considerations.

2. Referenced Documents

2.1 ASTM Standards:

- D 1898 Practice for Sampling of Plastics²
- D 4332 Practice for Conditioning Containers, Packages, and Packaging Components for Testing³
- E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁴
- F 88 Test Method for Seal Strength of Flexible Barrier Materials³
- F 1140 Test Methods for Failure Resistance of Unrestrained and Nonrigid Packages for Medical Applications³
- F 1327 Terminology Relating to Barrier Materials for Medical Packaging³

3. Terminology

3.1 *Definitions*—For definitions and terms used in this test method, see Terminology F 1327.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *flexible package or pouch, n*—refers to a package in which at least one of the sealed materials is of a flexible structure (that is, paper, polyethylene, etc.).

3.2.2 *restraining plates, n*—refers to plates that are rigid in nature and configured to contact and limit the packages expandable surface area as the package is pressurized.

4. Summary of Test Method

4.1 Packages are tested in an apparatus that internally pressurizes the package until an area of the package ruptures (burst). For most applications the rupture (burst) will occur at one or more areas of the seal. The pneumatic supply and pressurization equipment need the capability to maintain an increasing pressure until the seal area fails. During pressurization, the package shall be enclosed between two rigid and parallel plates (restraining plates) that limit the expansion and dimensional distortion of the package but allow the seal perimeter area to be unrestricted. A sensor inside the package detects the internal pressure at the point at which the package ruptures (burst). Dependent on the application, two configurations of restraining plates are indicated for use with this test

¹ This test method is under the jurisdiction of ASTM Committee F02 on Flexible Barrier Materials and is the direct responsibility of Subcommittee F02.60 on Medical Packaging.

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² Discontinued. See 1998 Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 15.09.

⁴ Annual Book of ASTM Standards, Vol 14.02.