



Standard Practices for Making Laboratory Heat Seals for Determination of Heat Sealability of Flexible Barrier Materials as Measured by Seal Strength¹

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1. Scope

1.1 These practices cover laboratory preparation of heat seals. These practices also cover the treatment and evaluation of heat seal strength data for the purpose of determining heat sealability of flexible barrier materials. It does not cover the required validation procedures for the production equipment.

1.2 Testing of seal strength or other properties of the heat seals formed by these practices is not included in this standard. Refer to Test Method **F88** for testing heat seal strength. This practice does not apply to hot tack testing, which is covered in **F1921**.

1.3 The practices of this standard are restricted to preparing heat seals using a sealer employing hot-bar or impulse sealing methods, or both.

1.4 This practice is intended to assist in establishing starting relationships for sealing flexible barrier materials. Additional guidance may be needed on how to set up sealing conditions for flexible barrier materials on commercial/production sealing equipment.

1.5 Seals may be made between webs of the same or dissimilar materials. The individual webs may be homogeneous in structure or multilayered (coextruded, coated, laminated, and so forth).

1.6 Strength of the heat seal as measured by Test Method **F88** is the sole criterion for assessing heat sealability employed in these practices.

1.7 Other aspects of heat sealability, such as seal continuity, typically measured by air-leak, dye penetration, visual examination, microorganism penetration, or other techniques, are not covered by these practices.

1.8 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

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

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1.9 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

F88 Test Method for Seal Strength of Flexible Barrier Materials

F1921 Test Methods for Hot Seal Strength (Hot Tack) of Thermoplastic Polymers and Blends Comprising the Sealing Surfaces of Flexible Webs

D4332 Practice for Conditioning Containers, Packages, or Packaging Components for Testing

3. Terminology

3.1 Definitions:

3.1.1 *dwelt time, n*—the time interval when the sealing jaws are in contact with, and exerting pressure on, the material being sealed.

3.1.2 *heat seal curve, n*—a plot of measured seal strength as a function of sealing temperature at a fixed dwell time and sealing pressure.

3.1.3 *heat seal strength, n*—force per unit width of seal required to progressively separate a flexible material from a rigid material or another flexible material, under the conditions of the test. Also known as seal strength.

3.1.4 *heat sealability, n*—the ability of thermoplastic polymers and blends, when comprising a sealing surface of a flexible web, that defines how well the material bonds to itself or a dissimilar material upon the application of pressure, heat, and dwell (time), as judged by the heat seal curve.

3.1.4.1 *Discussion*—Since heat seal strength can be measured either while the seal is still hot (hot tack) or after cooling

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.