



Standard Test Method for Evaluating the Tear Resistance of a Sealant Under Constant Strain¹

This standard is issued under the fixed designation C1681; 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 This test method evaluates the impact of an induced tear on a sealant specimen that is dimensioned, cured according to the guidelines in Test Method C719 and then subjected to a constant strain. It is effective in differentiating between sealants that are used in dynamic joints subject to abrasion, punctures, tears, or combination thereof.

1.2 Since this test method is for the evaluation of tear propagation, an adhesive failure to the substrates provides no usable data regarding tear propagation. This would be considered a failed test and that data would be discarded, or at least separated from the other data from specimens that did not experience an adhesive failure.

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.*

1.4 The committee with jurisdiction over this standard is not aware of any comparable standards published by other organizations.

2. Referenced Documents

2.1 *ASTM Standards:*²

C717 Terminology of Building Seals and Sealants

C719 Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)

3. Terminology

3.1 *Definitions*—Refer to Terminology C717 for definitions of the following terms used in this test method: casting spacer.

¹ This test method is under the jurisdiction of ASTM Committee C24 on Building Seals and Sealants and is the direct responsibility of Subcommittee C24.20 on General Test Methods.

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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 *separators*—rigid spacers used to maintain a constant strain on the joint specimens during the testing period while maintaining parallel bond surfaces.

4. Summary of Test Method

4.1 Test specimens are fabricated and cured in accordance with Test Method C719. At the end of the 21-day cure period, an induced tear is created in the specimens by making a cut with a sharp blade in the midpoint of the joint. The specimens are then extended to a specified strain at both standard conditions and at $-26 \pm 2^\circ\text{C}$ ($-15 \pm 3^\circ\text{F}$). Propagation of the induced tear is measured at 0, 24 and 168 h.

5. Significance and Use

5.1 This test method is intended to determine if a joint that is subjected to a mechanically induced cut will resist tear propagation during normal joint movement. A sealant with a high resistance to tear propagation will typically perform better than a sealant with a low resistance to tear propagation.

6. Apparatus

6.1 A device capable of extending the test specimens to the specified strain.

6.2 *Freezer*, to maintain a constant temperature of $-26^\circ\text{C} \pm 2^\circ\text{C}$.

6.3 A suitable measuring device such as calipers able to measure the induced tears to 0.01 mm.

6.4 *#17 Knife Blade*, 9 mm ($\frac{3}{8}$ in.) wide.

7. Reagents and Materials

7.1 *Spatulas*, for use in applying the sealant.

7.2 *Caulking Gun*, for extruding sealant from cartridges when applicable.

7.3 *Substrates*—twelve substrates, with minimum dimensions of 25 by 75 mm (1 by 3 in.) of the same finish are required for each product to be tested. Glass is the default substrate, however as mentioned in the scope, this is not an adhesion test, therefore the sealant must exhibit excellent adhesion to the substrate. Other rigid substrates in the above noted dimension are acceptable. Substrate blocks or plates