



Designation: C1914 – 21

Standard Test Method for Bake and Boil Testing of Laminated Glass¹

This standard is issued under the fixed designation C1914; 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 The purpose of this test method is to measure quantitatively the laminate stability under controlled conditions, specifically in relation to the formation of bubbles in a laminate with heat exposure.

1.2 This test method can be performed on laminates which have been exposed to weathering or as manufactured samples to determine the amount of excess air dissolved in the interlayer.

1.3 This test method determines the stability of laminated glass when subjected to high heat environments.

1.4 This test method outlines a procedure to be used on laminated glass with two or more layers of glass bonded by an interlayer.

1.5 This test method covers visual rating of tested specimens.

1.6 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.7 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.8 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²
C1172 [Specification for Laminated Architectural Flat Glass](#)

¹ This test method is under the jurisdiction of ASTM Committee C14 on Glass and Glass Products and is the direct responsibility of Subcommittee C14.08 on Flat Glass.

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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. Terminology

3.1 *Definitions:*

3.1.1 *boil tank, n*—a vessel capable of holding laminated glass specimens submerged in water at a set temperature for a specified amount of time.

4. Summary of Test Method

4.1 This test method involves engulfing the laminate in heat for a predetermined amount of time, removing the laminates from the heat source, allowing the specimen to cool and rating the number and location of any bubbles or other anomalies formed in the laminated glass.

5. Significance and Use

5.1 It is generally recognized that excess moisture and air within an interlayer will cause bubble formation in a laminate when exposed to heat or UV radiation, or both. These may be caused by initial moisture and air in the interlayer and be generated by thermal exposure. The purpose of this test method is to measure quantitatively the laminate stability under controlled conditions, specifically in relation to the formation of bubbles in the body of the laminate.

5.2 Subjecting the laminated glazing to extended heat at a controlled temperature and time provides the excess moisture and air which are forced into the interlayer during processing to surface as bubbles. This occurs only if there are excess moisture and air trapped in between the glass. Therefore, making these thermal tests efficient to determine proper de-airing of laminated glass products.

5.3 This test method provides a means to visually determine if discoloration has or is occurring and serves as a pass/fail test for some aspects of lamination quality.

5.4 This test method can be performed after natural or accelerated exposure to determine if there are changes to the polymer such as the stability with high temperature which is useful for understanding the visual stability of installed glazing.

5.5 This test method does not provide an indication of laminated glass capability for impact resistance, glass shard retention on breakage or edge stability of laminated glass.