



Designation: C712 – 22

# Standard Test Method for Bubbling of One-Part, Elastomeric, Solvent-Release Type Sealants<sup>1</sup>

This standard is issued under the fixed designation C712; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers determination of the degree of bubble formation or surface blistering in one-part, elastomeric solvent-release type sealants when exposed to elevated temperatures.

1.2 The subcommittee with jurisdiction is not aware of any similar ISO standard.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *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.*

1.5 *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:*<sup>2</sup>

**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: compound,

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

elastomer, elastomeric, sealant, solvent-release sealant, substrate, and standard conditions.

## 4. Significance and Use

4.1 The type and amount of solvent used in these sealants can sometimes give rise to surface bubbling (blistering) problems. The substrate used, whether porous or nonporous, will also have an effect. Although bubbling is often caused by misapplication, this test method is useful in differentiating between a sealant that develops an acceptably smooth surface and one that may have bubbling tendencies.

## 5. Apparatus

5.1 *Plates*, thin aluminum, approximately 3 in. (76 mm) wide by 5 in. (127 mm) long by 0.012 in. (0.30 mm) thick.

5.2 *Blocks*, prepare cement mortar, as described in Terminology **C719** to the following size: approximately 2 in. (51 mm) wide by 4 in. (102 mm) long by 1 in. (25 mm) thick.

NOTE 1—Other substrates such as brick, cast stone, marble, stainless steel, etc., may be specified either in place of the standard materials specified in 5.1 and 5.2 or in addition to them.

5.3 *Frame*, flat, rectangular, of 1/8-in. (3.2-mm) steel or brass, with an opening of 1 in. by 3 3/4 in. (25 mm by 95 mm) and outside dimensions of approximately 2 in. by 4 3/4 in. (51 mm by 121 mm).

5.4 *Spatula*, steel, with knife edge.

5.5 *Oven*, forced-draft type, having a temperature controlled at  $122 \pm 3.6$  °F ( $50 \pm 2$  °C).

## 6. Test Specimen

6.1 Create the test specimen from a previously unopened container of sealant as received from the sealant manufacturer.

## 7. Procedure

7.1 Prepare three test specimens on each substrate as follows: Center the frame on the test substrate and carefully fill it with compound, avoiding air pockets. Strike off the surface of the compound flush with the frame, to a uniform thickness of 1/8 in. (3.2 mm). With the spatula, cut all around the outside edge of the compound and lift the frame straight up and off.

7.2 Condition the specimens for 48 h at standard conditions.

**TABLE 1 Precision and Bias Data**

Material	Average	Estimated Standard Deviation Within Laboratory	Estimated Standard Deviation Between Laboratories	Repeatability Interval	Reproducibility
G1	0.000	0.000	0.000	0.000	0.000
G2	0.064	0.209	0.212	0.590	0.600
G3	0.011	0.028	0.020	0.079	0.078

7.3 Place the specimens in the oven at  $122 \pm 3.6$  °F ( $50 \pm 2$  °C) for 72 h.

7.4 After heat exposure, allow the specimens to cool at  $73.4 \pm 3.6$  °F ( $23 \pm 2$  °C) for 1 h.

7.5 Examine each specimen for surface gas bubbles.

## 8. Report

8.1 For each substrate, report the total surface area covered by the bubbles, estimated to the nearest  $0.1 \text{ in.}^2$  ( $65 \text{ mm}^2$ ). The area of bubble formation may be estimated by superimposing on the specimen a glass or clear plate ruled into  $\frac{1}{2}$ -in. (13-mm) squares.

## 9. Precision and Bias<sup>3</sup>

9.1 The precision and bias calculations for this test method are based on the results of four laboratories testing three materials using five specimens per test. The results are given in [Table 1](#).

<sup>3</sup> Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR:C24-1021.

9.1.1 At 95 % confidence level a variation of as much as  $0.59 \text{ in.}^2$  can be expected within a laboratory and  $0.60 \text{ in.}^2$  between laboratories. This is based on three materials being tested by four laboratories.

## 10. Keywords

10.1 bubbling; elastomeric; solvent-release sealant

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