



Standard Test Method for Bubbling of One-Part, Elastomeric, Solvent-Release Type Sealants¹

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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 *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:

C 717 Terminology of Building Seals and Sealants²

D 1191 Test Methods for Concrete Joint Sealers³

3. Terminology

3.1 **Definitions**—Refer to Terminology C 717 for definitions of the following terms used in this test method: compound, elastomer, elastomeric, sealant, solvent-release sealant, substrate.

4. Significance and Use

4.1 The type and amount of solvent used in these sealants can sometimes give rise to surface bubbling and blistering problems. The substrate used, whether porous or nonporous, will also have an effect. Although blistering 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 blistering 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**, cement mortar, approximately 2 in. (51 mm) wide by 4 in. (102 mm) long by 1 in. (25 mm) thick prepared as described in Test Methods D 1191.

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 $\frac{1}{8}$ -in. (3.2-mm) steel or brass, with an opening of 1 by $3\frac{3}{4}$ in. (25 by 95 mm) and outside dimensions of approximately 2 by $4\frac{3}{4}$ in. (51 by 121 mm).

5.4 **Spatula**, steel, with knife edge.

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

6. Test Specimen

6.1 Take the test specimen from a previously unopened container 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 $\frac{1}{8}$ 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 $73.4 \pm 3.6^\circ\text{F}$ ($23 \pm 2^\circ\text{C}$) and $50 \pm 5\%$ relative humidity.

7.3 Place the specimens in the oven at $122 \pm 3.6^\circ\text{F}$ ($50 \pm 2^\circ\text{C}$) for 72 h.

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

7.5 Examine each specimen for surface gas bubbles and blisters.

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 Sealant Standards.

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² *Annual Book of ASTM Standards*, Vol 04.07.

³ Discontinued. Replaced by D 5329. See 1995 *Annual Book of ASTM Standards*, Vol 04.03.

8. Report

8.1 For each substrate, report the total surface area covered by the bubbles or blisters, estimated to the nearest 0.1 in.² (65 mm²). The area of bubble formation may be estimated by superimposing on the specimen a glass or clear plate ruled into ½-in. (13-mm) squares.

9. Precision and Bias ⁴

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.

⁴ Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR: C24-1021.

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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

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

10. Keywords

10.1 bubbling; elastomeric; solvent-release sealant