



Standard Test Method for Low-Temperature Flexibility of Latex Sealants After Artificial Weathering¹

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1. Scope

1.1 This test method covers a laboratory procedure for the determination of low-temperature flexibility of latex sealants after 500 h artificial weathering.

1.2 The values stated in metric (SI) units are to be regarded as the standard. The values given in parentheses are for information only.

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.*

NOTE 1—Currently there is no ISO standard similar to this test method.

2. Referenced Documents

2.1 ASTM Standards:

C 717 Terminology Building Seals and Sealants²

G 23 Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials³

G 26 Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials³

2.2 Other Standards:

CSA Specification HA-4 CC42⁴

3. Terminology

3.1 *Definitions*—Refer to Terminology C 717 for definitions of the following terms used in this test method: adhesive failure, latex sealant, sealant, substrate.

¹ This test method is under the jurisdiction of ASTM Committee C24 on Building Seals and Sealants and is the direct responsibility of Subcommittee C 24.40 on Weathering.

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

³ *Annual Book of ASTM Standards*, Vol 06.01.

⁴ Available from Canadian Government Specification Board, c/o Dept. of Supply and Services, Ottawa 4, Canada.

4. Summary of Test Method

4.1 A slab of the sealant is exposed, after drying, for 500 h in an artificial weathering unit, after which it is conditioned and flexed at $-17 \pm 1^\circ\text{C}$ ($0 \pm 2^\circ\text{F}$).

5. Significance and Use

5.1 This test evaluates the flexibility of artificially weathered latex sealants in a low-temperature environment.

6. Apparatus

6.1 *T3 Temper Alclad Aluminum Panels*, three, each 76 by 153-mm (3 by 6-in.) of 16 to 24 gage (1.29 to 0.511 mm), conforming with CSA Specification HA-4 CC42.

6.2 *Accelerated Weathering Unit*—One of the units either of the Type D through F as described in Practice G 23 or Type A through BH as described in Practice G 26, plus a 102-18 cycling cam and black panel accessories.

6.3 *Cold Box or Freezer*.

6.4 *Mandrel, Wood or Metal*, 25 mm (1 in.) in diameter.

6.5 *Template*, consisting of a 3.2-mm ($1/8$ -in.) thick brass plate with a rectangular opening 38 by 127 mm ($1\frac{1}{2}$ by 5 in.).

6.6 *Spatula*, metal.

7. Sampling

7.1 Take the sealant to be tested directly from the container as commercially supplied by the manufacturer.

8. Test Specimens

8.1 Prepare three test specimens as follows:

8.1.1 Center the template on an aluminum panel, fill it to excess with the sealant, and strike the excess off flush with the surface of the template with the metal spatula.

8.1.2 Cut around the perimeter of the sealant, next to the template, with the spatula, and carefully remove template.

9. Conditioning

9.1 Condition the three specimens for 2 days at $23 \pm 1^\circ\text{C}$ ($73.4 \pm 2^\circ\text{F}$).

10. Procedure

10.1 Place the conditioned specimens in the artificial weathering unit and cycle them for 500 h, beginning with the start of the light cycle. The light temperature shall be $60 \pm 1^\circ\text{C}$ ($140 \pm 2^\circ\text{F}$) and the water temperature $23 \pm 1^\circ\text{C}$ ($73.4 \pm 2^\circ\text{F}$).

10.2 Following artificial weathering exposure, place the specimens and the mandrel in a cold box maintained at $-17 \pm 1^\circ\text{C}$ ($0 \pm 2^\circ\text{F}$) for 4 h.

10.3 While still in the cold box, place each specimen in turn on the mandrel, with the aluminum plate next to the mandrel, and, without holding the sealant, bend the specimen 90° around the mandrel within 1 s.

10.4 Visually examine the specimens after bending, for cracking of the sealant or adhesive failure to the aluminum, or both.

11. Report

11.1 Report whether the sealant cracks through to the substrate, or fails adhesively to the aluminum panel.

12. Precision and Bias

12.1 No statement is made about either the precision or bias of this test method for measuring low temperature flexibility since the result states merely whether there is conformance to the criteria for success specified in the procedure.

13. Keywords

13.1 artificial weathering; flexibility; latex sealant

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