



Standard Test Method for Volume Shrinkage of Latex Sealants During Cure¹

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1. Scope

1.1 This test method covers a laboratory procedure for determining volume shrinkage, which occurs during cure, of a latex sealant.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are provided 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—A related ISO standard is ISO 10563. The user should compare to determine how it differs from this test method.

2. Referenced Documents

2.1 ASTM Standards:

C 717 Terminology of Building Seals and Sealants²

D 1475 Test Method for Density of Paint, Varnish, Lacquer, and Related Products³

2.2 ISO Standards:⁴

ISO 10563 Building Construction—Sealants—Determination of Change in Mass and Volume

3. Terminology

3.1 *Definitions*—Refer to Terminology C 717 for definitions of the following terms used in this test method: cure, joint, latex sealant, sealant, shrinkage (volume), and tooling.

4. Summary of Test Method

4.1 The sealant is extruded onto polyethylene release film and weighed. After curing for 28 days, its volume shrinkage is calculated using the sealant's density, the percent weight lost during the 28-day cure, and the density of water. The density of the sealant is determined by the weight-per-gallon cup procedure described in Test Method D 1475.

5. Significance and Use

5.1 Shrinkage of a sealant, after application in a building joint, is caused by loss of volatile components from the sealant. This loss results in a decrease in volume and, hence, a change in the sealant's shape. This change in shape, in some applications, should be taken into consideration for acceptable joint appearance and geometry.

5.2 The shrinkage value obtained by this test method helps predict the appearance and geometry of the cured sealant in a building joint and is helpful in determining the amount and type of tooling to be done during installation of the sealant.

5.3 Latex sealants cure primarily through water evaporation. They may also contain small amounts of other volatile components. However, in this test method all volatiles are treated as water. This assumption still provides a meaningful shrinkage value since the small quantities of other volatiles and their differences in density from that of water do not significantly affect the usefulness of the result obtained.

6. Apparatus

6.1 *Polyethylene Film*—Three sheets, each about 51 by 51 mm (2 by 2 in.) by 0.127 mm (5 mil) thick.

6.2 *Weight-per-Gallon Cup*, 80 to 90 mL capacity.

6.3 *Constant Temperature Bath or Room*, held at $23 \pm 2.0^\circ\text{C}$ ($73 \pm 3.6^\circ\text{F}$).

6.4 *Forceps*.

6.5 *Distilled Water*.

7. Procedure

7.1 Standard conditions of temperature and relative humidity for the test shall be $23 \pm 2^\circ\text{C}$ ($73 \pm 3.6^\circ\text{F}$) and $50 \pm 5\%$, respectively.

7.2 Condition the sealant to be tested in a closed container at standard conditions for at least 24 h.

7.3 Condition approximately 2 L of distilled water at standard conditions for at least 24 h.

7.4 Determine the density (D_s) in grams per millilitre of fresh sealant by Test Method D 1475. Record the average density (D_s) of three determinations.

NOTE 2—It is very important that the volume of the weight-per-gallon cup be accurately determined according to the calibration procedure described in Test Method D 1475. Use distilled water from 7.3. Determine

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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 American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.