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Standard Test Method for Bond of Oil- and Resin-Base Caulking Compounds¹

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1. Scope

1.1 This test method describes a laboratory procedure for determining the degree of bond (adhesion) of oil- and resin-base caulking compounds to glass when the caulking compound is subjected to stress.

1.2 The values stated in metric (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.*

2. Referenced Documents

- 2.1 *ASTM Standard:*
C 717 Terminology of Building Seals and Sealants²

3. Terminology

3.1 *Definitions*—Refer to Terminology C 717 for definitions of the following terms used in this test method: adhesion failure (loss of adhesion) and caulking compound.

4. Significance and Use

4.1 When a caulking compound is subjected to movement, it can lose adhesion from the substrate or substrates to which it is bonded. This test method provides a laboratory test to determine loss of bond when an oil- or resin-base caulking compound is subjected to a specified amount of movement after being conditioned for 5 days at $50 \pm 2^\circ\text{C}$ ($122 \pm 3.6^\circ\text{F}$).

5. Apparatus and Materials

5.1 *Gravity-Convection Oven*, having a temperature controlled at $50 \pm 2^\circ\text{C}$ ($122 \pm 3.6^\circ\text{F}$).

5.2 *Steel Spatula*, about 102 mm (4 in.) long and about 19 mm ($3/4$ in.) wide.

5.3 *Glass Plate*, 89 mm ($3\frac{1}{2}$ in.) square and about 3 mm ($1/8$ in.) thick.

5.4 *Standard Limestone Block*,³ 89 mm ($3\frac{1}{2}$ in.) square and 16 to 19 mm ($5/8$ to $3/4$ in.) thick.

5.5 *Two Brass Rods*, 102 mm (4 in.) long and 8 mm ($5/16$

in.) in diameter that have been milled off on two opposite sides to give a thickness of 6 mm ($1/4$ in.).

5.6 *Wrench or Pliers*.

5.7 *Glass or Plastic Plate*, about 63.5 by 89 mm ($2\frac{1}{2}$ by $3\frac{1}{2}$ in.), ruled into 12.7-mm ($1/2$ -in.) squares.

6. Reagent

6.1 *Solvent*, such as methyl ethyl ketone, ethylene dichloride, acetone, etc.

7. Sampling

7.1 The compound to be tested shall be taken from a previously unopened container and thoroughly mixed before using.

8. Conditioning

8.1 The test shall be performed in a laboratory controlled at $23 \pm 2^\circ\text{C}$ ($73.4 \pm 3.6^\circ\text{F}$), and $50 \pm 10\%$ relative humidity. The caulking compound shall be conditioned for at least 5 h at standard temperature and relative humidity before any laboratory tests are made.

9. Procedure

9.1 Thoroughly clean the glass plate with a solvent, such as methyl ethyl ketone. Brush dust and loose dirt off the limestone block.

9.2 Adhere the rods temporarily to the stone block with flattened sides in contact with the stone, each parallel to and about 6 mm ($1/4$ in.) away from opposite edges of the block.

9.3 Spread a layer of the compound over the surface of the stone between the rods and build it up to a thickness slightly greater than 6 mm ($1/4$ in.). Then apply a thin layer of the compound to one surface of the glass plate in a strip 63.5 mm ($2\frac{1}{2}$ in.) wide so there are no bubbles between the glass and the compound (see Fig. 1).

9.4 Place the plate on top of the rods with the strip of compound in contact with the layer between the rods and force it down. Clean from the specimen the excess compound forced out of the joint.

9.5 Expose the specimen in a gravity-convection oven controlled at $50 \pm 2^\circ\text{C}$ ($122 \pm 3.6^\circ\text{F}$) for 120 h.

9.6 Remove the specimen at the end of the exposure period, and after the specimen is allowed to cool to room temperature, perform the test by rotating the rods, one at a time, 90 deg with a wrench or pliers, so they will roll away from the compound, thus increasing the thickness of the joint by 25 %.

9.7 Estimate the area of separation from the glass by superimposing on the specimen a glass or clear plastic plate ruled into 12.7-mm ($1/2$ -in.) squares.

¹ This test method is under the jurisdiction of ASTM Committee C-24 on Building Seals and Sealants, and is the direct responsibility of Subcommittee C24.12 on Oil and Resin Base Glazing and Caulking Sealants.

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

³ Standard Limestone blocks are available from Alabama Limestone, P.O. Box 154, Route 3, Russellville, AL 35653.

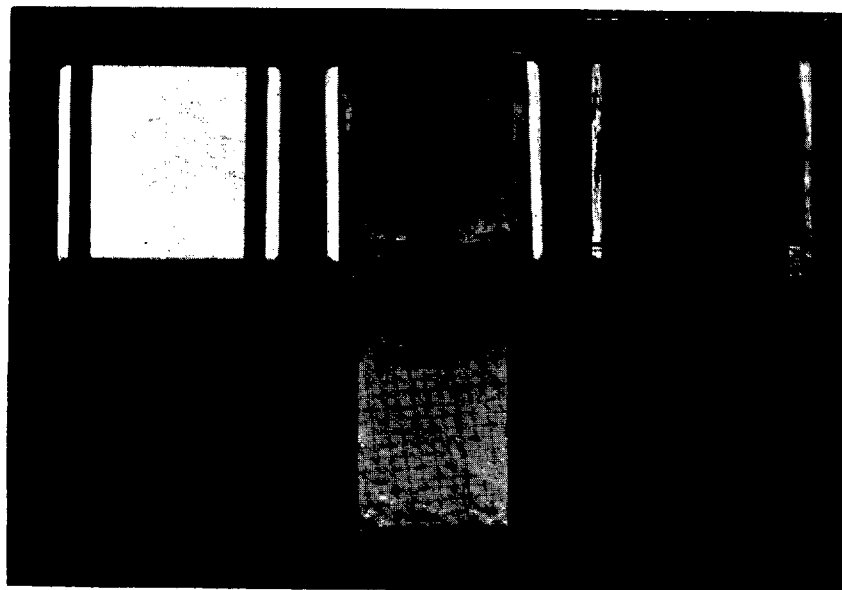


FIG. 1 Stages in the Bond Test Procedure

10. Report

10.1 Report the percent of bond loss from the glass.

however, a task group of Subcommittee C24.12 has been established to investigate the subject and prepare a statement.

11. Precision and Bias

11.1 Precision and bias data are not available at this time;

12. Keywords

12.1 adhesion; bond; caulking compound

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