



Standard Test Method for Rheological (Flow) Properties of Elastomeric Sealants¹

This standard is issued under the fixed designation C 639; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This test method describes a laboratory procedure for the determination of rheological (flow) properties of single- and multicomponent chemically curing sealants for use in building construction.

1.2 Other suitable flow characteristics may be agreed upon between the seller and purchaser or specifier. Special nonsag properties and lower flow characteristics may be required for use in sloping joints where absolute leveling is not desired.

NOTE 1—The sealants are supplied in various rheological properties ranging from pourable fluids to stiff nonsagging pastes. Multicomponent sealants are supplied as a base component with an activator or curing agent separately packaged. After mixing the two parts, the sealant is ready for application. Single-component sealants are supplied ready for use upon opening of the package and usually depend on the external environment for cure.

1.3 This test method describes four types of joint sealants:

1.3.1 *Type I*—Single-component flowable or self-leveling,

1.3.2 *Type II*—Single-component nonsag,

1.3.3 *Type III*—Multicomponent flowable or self-leveling, and

1.3.4 *Type IV*—Multicomponent nonsag.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 *This standard does not purport to address the safety problems 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

3. Terminology

3.1 *Definitions*—Refer to Terminology C 717, Section 4.1, for definitions of the following terms used in this standard:

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 C24.32 on Chemically Curing Sealants.

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

chemically curing sealants, compound, elastomeric, flow (slump), non-sag sealant (non-slump), sealant, self-leveling sealant (flowable).

4. Significance and Use

4.1 The results obtained from this test method are simply a measure of the degree of horizontal or vertical flow of single-component or multi-component sealants when applied to a set joint configuration at two pre-determined temperatures. Only samples conditioned at the same temperature may be directly compared.

5. Apparatus

5.1 *Refrigerator*, controlled at $4.4 \pm 2^\circ\text{C}$ ($40 \pm 3.6^\circ\text{F}$).

5.2 *Oven*, convention-type, controlled at $50 \pm 2^\circ\text{C}$ ($122 \pm 3.6^\circ\text{F}$).

5.3 *Channel*, one, stainless steel (Type 304, No. 2-B finish, No. 16 gage), inside dimensions 19 mm wide, 13 mm deep, 152 mm long ($\frac{3}{4}$ by $\frac{1}{2}$ by 6 in.), and closed at both ends (see Fig. 1a).

5.4 *Channels*, two, stainless steel (Type 304, No. 2-B finish, No. 16 gage), inside dimensions 19 mm wide, 13 mm deep, 152 mm long ($\frac{3}{4}$ by $\frac{1}{2}$ by 6 in.) with both ends open and the back surface extended 51 mm (2 in.) (see Fig. 1b).

6. Standard Test Conditions

6.1 Unless otherwise specified, standard conditions shall be $23 \pm 2^\circ\text{C}$ ($73.4 \pm 3.6^\circ\text{F}$) and $50 \pm 5\%$ relative humidity.

7. Procedures

7.1 *Test for Type I Sealants:*

7.1.1 Clean the closed-end channel (Fig. 1a) with methyl ethyl ketone or similar solvent followed by a thorough cleaning with a detergent solution and a final rinse with distilled or deionized water, and then air dry.

7.1.2 Before preparing the test assembly, condition at least 100 g of the compound under test in the unopened container for at least 16 h at standard conditions. Then condition the compound for 16 to 24 h and the channel for 2 h in a refrigerator held at $4.4 \pm 2^\circ\text{C}$ ($40 \pm 3.6^\circ\text{F}$). At the end of the conditioning periods, pour the compound into the conditioned channel held horizontally at the latter temperature and maintain the test specimen at this temperature for 4 h. At the end of this period, examine the compound for flow properties.