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Standard Test Methods for Joint Sealants, Hot-Poured, for Concrete and Asphalt Pavements¹

This standard is issued under the fixed designation D 3407; 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 reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

^{ε1} NOTE—Keywords were added editorially in June 1994.

1. Scope

1.1 These test methods cover the following tests for bituminous hot-poured types of joint sealants for portland cement concrete and asphaltic concrete pavements: cone penetration, flow, bond at low temperatures, resilience, asphalt compatibility, and prolonged heating.

1.2 *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 33 Specification for Concrete Aggregates²
- C 150 Specification for Portland Cement³
- C 192 Practice for Making and Curing Concrete Test Specimens in the Laboratory²
- D 5 Test Method for Penetration of Bituminous Materials⁴
- D 217 Test Method for Cone Penetration of Lubricating Grease⁵
- D 1074 Test Method for Compressive Strength of Bituminous Mixtures⁴
- D 1559 Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus⁴
- D 1561 Practice for Preparation of Bituminous Mixture Test Specimens by Means of California Kneading Compactor⁴

3. Sample Preparation

3.1 Select a sample of the fresh material, weighing approximately 600 g, in such a manner as to avoid inclusion of the surface layer or any container liner. Heat 200 g of the sample in a clean oil-jacketed melter equipped with mechanical agitation (see Figs. 1 and 2) to a pouring consistency. The temperature of the oil bath shall not exceed the safe heating

temperature by more than 75°F (42°C) and, in no case, shall be more than 550°F (288°C). Add the remaining 400 g, in quantities of approximately 50 g at a time, to the melted material, continuing agitation. Continue the heating and stirring until the entire sample is at the maximum safe heating temperature.

4. Standard Conditions

4.1 The laboratory atmospheric conditions, hereinafter referred to as standard conditions, shall be: temperature $75 \pm 7^\circ\text{F}$ ($24 \pm 4^\circ\text{C}$), and relative humidity $50 \pm 10\%$. The specimens prepared as hereinafter prescribed shall be stored under standard conditions until needed for testing.

5. Penetration

5.1 Make this test in accordance with Test Method D 5, except use a penetration cone in place of the standard penetration needle. The cone shall conform to the requirements given in Test Methods D 217, except that the interior construction may be modified as desired. The total moving weight of the cone and attachments shall be 150.0 ± 0.1 g.

6. Flow

6.1 *Test Specimens*—Pour a portion of the sample prepared in accordance with Section 3 into a suitable (See Note 1) mold of 40 mm wide by 60 mm long by 3.2 mm deep, placed on a bright tin panel. Fill the mold with an excess of material. Allow the test specimen to cool at room temperature for at least $\frac{1}{2}$ h; then trim the specimen flush with the face of the mold with a heated metal knife or spatula.

NOTE 1—A release agent should be used where it is necessary to separate the material being tested from the metal. A nontoxic, water-washable, release agent recommended for this purpose is prepared by grinding into a smooth paste a mixture of approximately 50 % talc, 35 % glycerin and 15 % by weight of a water-soluble medical lubricant.⁶

6.2 *Procedure*—Remove the mold and place the panel containing the sample in a forced-draft oven maintained at $140 \pm 2^\circ\text{F}$ ($60 \pm 1.1^\circ\text{C}$) for 5 h. During the test, mount the panel so that the longitudinal axis of the specimen is at an angle of $75 \pm 1^\circ$ with the horizontal, and the transverse axis is horizontal. Measure the change in length in millimetres of the specimen during the 5-h test period, and report as the flow.

¹ These test methods are under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and are the direct responsibility of Subcommittee D04.33 on Formed-In-Place Sealants for Joints and Cracks in Pavements.

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² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.01.

⁴ Annual Book of ASTM Standards, Vol 04.03.

⁵ Annual Book of ASTM Standards, Vol 05.01.

⁶ KY Jelly, available at drug stores, has been found suitable for this purpose.