
Standard Practice for Accelerated Aging of Hot-Poured Asphalt Crack Sealant Using a Vacuum Oven

AASHTO Designation: R 95-22¹

Technically Revised: 2022

Technical Subcommittee: 4e, Joints and Bearings



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1. SCOPE

- 1.1. This standard practice applies to hot-poured asphalt crack sealant used in the construction and maintenance of roadways.
- 1.2. The standard practice covers the accelerated aging of hot-poured asphalt crack sealant material by means of elevated temperatures and vacuum as specified in M 338 and PP 85.
- 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 and follow appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.*
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2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- M 338, Performance-Graded Hot-Poured Asphalt Crack Sealant
 - M 339M/M 339, Thermometers Used in the Testing of Construction Materials
 - PP 85, Grading or Verifying the Sealant Grade (SG) of a Hot-Poured Asphalt Crack Sealant
 - R 28, Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)
 - T 368, Measuring Low-Temperature Flexural Creep Stiffness of Hot-Poured Asphalt Crack Sealant by Bending Beam Rheometer (BBR)
 - T 369, Evaluation of the Low-Temperature Tensile Property of Hot-Poured Asphalt Crack Sealant by Direct Tension Test
 - T 370, Measuring Adhesion of Hot-Poured Asphalt Crack Sealant Using Direct Adhesion Tester
- 2.2. *ASTM Standards:*
- D5167, Standard Practice for Melting of Hot-Applied Joint and Crack Sealant and Filler for Evaluation
 - E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
 - E77, Standard Test Method for Inspection and Verification of Thermometers
 - E145, Standard Specification for Gravity-Convection and Forced-Ventilation Ovens
 - E230/E230M, Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples
 - E879, Standard Specification for Thermistor Sensors for General Purpose and Laboratory Temperature Measurements

- E1137/E1137M, Standard Specification for Industrial Platinum Resistance Thermometers
- E2877, Standard Guide for Digital Contact Thermometers

2.3. *International Electrotechnical Commission Standard:*

- IEC 60751:2008, Industrial Platinum Resistance Thermometers and Platinum Temperature Sensors

3. TERMINOLOGY

3.1. *Definition:*

- 3.1.1. *hot-poured asphalt crack sealant*—polymer- or rubber-modified asphalt binder most often formulated with a mineral filler.

Note 1—Based on the references, hot-poured asphalt crack sealant is typically applied at a temperature of 160°C or above.

4. SUMMARY OF PRACTICE

- 4.1. Hot-poured asphalt crack sealant material is placed in a stainless steel pan and aged at 115°C for 16 h under a vacuum of 75.9 cmHg.

5. SIGNIFICANCE AND USE

- 5.1. This standard practice is designed to simulate the aging and weathering of hot-poured asphalt crack sealant.
- 5.2. Hot-poured asphalt crack sealant material aged with this standard practice is best used to evaluate sub-zero characteristics.
- 5.3. For hot-poured asphalt crack sealant materials with different asphalt binder sources, polymer grades, and filler types and content, there is no unique correlation between the accelerated conditions and the time of in-service weathering. The accelerated aging leads to hot-poured asphalt crack sealant rheology typical of sealants weathered 1 to 10 yr in the field.
- 5.4. Hot-poured asphalt crack sealant must be remixed before being aged by this standard practice.

6. APPARATUS

- 6.1. *Vacuum Oven*—Oven with a vacuum valve, a bleed valve, and a pressure gauge in centimeters of mercury (cmHg). The oven must be capable of maintaining a vacuum of 75.9 ± 2 cmHg and a uniform temperature of $115 \pm 1^\circ\text{C}$. Refer to ASTM E145 to verify temperature uniformity. The oven should be of a size sufficient to accommodate a minimum of eight sample pans of 6 in. diameter on two shelves. Vacuum oven(s) shall be properly standardized and capable of operation at the temperatures required, between 110 to 120°C, within $\pm 1^\circ\text{C}$. More than one oven may be used, provided each is used within its proper operating temperature range. The thermometer for measuring the temperature within the oven(s) shall meet the requirements of M 339M/M 339 with a temperature range of at least 90 to 130°C, and an accuracy of $\pm 0.25^\circ\text{C}$ (see Note 2).

Note 2—Thermometer types suitable for use include ASTM E1 mercury thermometers; ASTM E879 thermistor thermometer; ASTM E1137M Pt-100 RTD platinum resistance thermometer, Special Order; or IEC 60751: 2008 Pt-100 RTD thermometer, Special Order.