
Standard Practice for Grading or Verifying the Sealant Grade (SG) of a Hot-Poured Asphalt Crack Sealant

AASHTO Designation: R 116-23¹

Adopted without Revisions: 2023

Technical Subcommittee: 4e, Joints and Bearings



**American Association of State Highway and Transportation Officials
555 12th Street NW, Suite 1000
Washington, DC 20004**

Standard Practice for

Grading or Verifying the Sealant Grade (SG) of a Hot-Poured Asphalt Crack Sealant

AASHTO Designation: R 116-23¹



Adopted without Revisions: 2023

Technical Subcommittee: 4e, Joints and Bearings

1. SCOPE

- 1.1. This standard practice describes the testing required to determine the sealant grade (SG) of a hot-poured asphalt crack sealant according to M 338, Table 1. It presents two approaches. In the first, the SG of an unknown hot-poured asphalt crack sealant is determined. In the second, the nominal SG of a hot-poured asphalt crack sealant is verified. It also provides an estimate of the time required to complete a single test sequence.
- 1.2. *This standard practice may involve hazardous material, operations, and equipment. This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practice and determine the applicability of regulatory limitations prior to use.*

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- < M 338, Performance-Graded Hot-Poured Asphalt Crack Sealant
 - < R 95, Accelerated Aging of Hot-Poured Asphalt Crack Sealant Using a Vacuum Oven
 - < T 366, Apparent Viscosity of Hot-Poured Asphalt Crack Sealant Using Rotational Viscometer
 - < 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 a Direct Adhesion Tester
 - < T 404, Evaluation of the Tracking Resistance of Hot-Poured Asphalt Crack Sealant by Dynamic Shear Rheometer (DSR)
- 2.2. *ASTM Standard:*
- < D5167, Standard Practice for Melting of Hot-Applied Joint and Crack Sealant and Filler for Evaluation

3. SUMMARY OF THE PRACTICE

- 3.1. The sample of hot-poured asphalt crack sealant is homogenized in accordance with ASTM D5167 for $1 \text{ h} \pm 10 \text{ min}$ at the manufacturer's recommended installation temperature. Portions of the

homogenized sample are used to test viscosity (T 366) and sealant flow and deformation (referred to as flow coefficient and shear thinning in T 404).

- 3.2. The hot-poured asphalt crack sealant is aged in the vacuum oven (R 95), and the residue is tested to determine the creep stiffness (S) and average creep rate of the log creep stiffness versus log time relationship at 240 s (T 368), extendibility in direct tension (T 369), and maximum adhesion load (T 370).
- 3.3. Based on these test results, the hot-poured asphalt crack sealant is graded according to M 338, Table 1.

4. SIGNIFICANCE AND USE

- 4.1. This practice describes the testing required for grading or verifying the SG of a hot-poured asphalt crack sealant according to M 338, Table 1.

5. ESTIMATED TIME NECESSARY FOR TESTING

- 5.1. For both testing and verification, if the analysis is started at the beginning of a morning work shift, all testing and analysis should be completed during the afternoon of the next day. This schedule provides the 16 h needed for conditioning of hot-poured asphalt crack sealant material in the vacuum oven. Samples can be aged and analyzed in parallel, and the productivity of the laboratory thus increased. However, for the purpose of this document, analysis of a single hot-poured asphalt crack sealant will be discussed.

6. TEST PROCEDURE FOR GRADING AN UNKNOWN HOT-POURED ASPHALT CRACK SEALANT

- 6.1. Prepare samples and test specimens using the procedures specified in the applicable test methods. In the case where the grade of a hot-poured asphalt crack sealant is unknown, approximately 550 g of unaged hot-poured asphalt crack sealant is required to complete the tests with the necessary replicates.
- 6.2. Homogenize the hot-poured asphalt crack sealant according to ASTM D5167 for 1 h $\pm$ 10 min at the manufacturer's recommended installation temperature. Homogenize a sufficient amount of hot-poured asphalt crack sealant depending on the type and number of tests to be performed.
Note 1—Four crack sealant bending beam rheometer (CSBBR) beam specimens requiring Vacuum Oven Aged (VOA) residue are needed at each test temperature. In addition, at least six crack sealant direct tension (CSDT) specimens and six crack sealant adhesion test (CSAT) specimens requiring VOA residue will also be needed at each test temperature. A minimum of two test temperatures will be required. This testing will utilize approximately 300 g of homogenized hot-poured asphalt crack sealant material.
- 6.3. Determine the viscosity of the homogenized hot-poured asphalt crack sealant at installation temperature using T 366. The viscosity shall be higher than 1.0 Pa·s and must not exceed 3.5 Pa·s to meet the requirements of M 338.
Note 2—The installation temperature should be in accordance with the manufacturer's recommendation for each hot-poured asphalt crack sealant type.
- 6.4. If the homogenized hot-poured asphalt crack sealant does not meet M 338 requirements for the test in Section 6.3, the hot-poured asphalt crack sealant will not satisfy the specification for any SG, and no further testing is required.