
Standard Specification for

Performance-Graded Asphalt Binder



AASHTO Designation: MP 1a-04^{1,2}

1. SCOPE

This specification covers asphalt binders graded by performance. Grading designations are related to the average 7-day maximum pavement design and minimum pavement design temperatures. This specification incorporates new procedures for determining the critical low cracking temperature using a combination of the T 313 and T 314 test procedures. This testing regimen is a rigorous approach that is inclusive of most modified materials.

Note 1—For asphalt binders graded by penetration at 25°C, see M 20. For asphalt binders graded by viscosity at 60°C, see M 226.

Note 2—R 29 provides information for determining the performance grade of an asphalt binder.

2. REFERENCED DOCUMENTS

2.1. AASHTO Standards:

- M 20, Penetration-Graded Asphalt Cement
- M 226, Viscosity-Graded Asphalt Cement
- M 323, Superpave Volumetric Mix Design
- PP 42, Determining Low-Temperature Performance Grade (PG) of Asphalt Binders
- R 28, Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)
- R 29, Grading or Verifying the Performance Grade of an Asphalt Binder
- R 35, Superpave Volumetric Design for Hot-Mix Asphalt (HMA)
- T 40, Sampling Bituminous Materials
- T 44, Solubility of Bituminous Materials
- T 48, Flash and Fire Points by Cleveland Open Cup
- T 55, Water in Petroleum Products and Bituminous Materials by Distillation
- T 201, Kinematic Viscosity of Asphalts (Bitumens)
- T 202, Viscosity of Asphalts by Vacuum Capillary Viscometer
- T 240, Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin-Film Oven Test)
- T 313, Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)
- T 314, Determining the Fracture Properties of Asphalt Binder in Direct Tension
- T 315, Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)
- T 316, Viscosity Determination of Asphalt Binder Using Rotational Viscometer

- 2.2. *ASTM Standards:*
- D 8, Standard Definitions of Terms Relating to Materials for Roads and Pavements
 - D 5546, Standard Test Method for Solubility of Polymer-Modified Asphalt Materials in 1,1,1, Trichloroethane

3. TERMINOLOGY

- 3.1. *Definitions:*
- 3.1.1. Definitions for many terms common to asphalt cement are found in ASTM D 8.
- 3.1.2. *asphalt binder*—an asphalt-based cement that is produced from petroleum residue either with or without the addition of non-particulate organic modifiers.

4. ORDERING INFORMATION

- 4.1. When ordering under this specification, include in the purchase order the performance grade of asphalt binder required from Table 1 (e.g., PG 52-16 or PG 64-34).
- 4.2. Asphalt binder grades may be selected by following the procedures described in M 323 and R 35.

5. MATERIALS AND MANUFACTURE

- 5.1. Asphalt binder shall be prepared by the refining of crude petroleum by suitable methods, with or without the addition of modifiers.
- 5.2. Modifiers may be any organic material of suitable manufacture, used in virgin or recycled condition, and that is dissolved, dispersed or reacted in asphalt cement to enhance its performance.
- 5.3. The asphalt binder shall be homogeneous, free from water and deleterious materials, and shall not foam when heated to 175°C.
- 5.4. The asphalt binder shall be at least 99.0 percent soluble as determined by T 44 or D 5546.
- 5.5. This specification is not applicable for asphalt binders in which fibers or other discrete particles are larger than 250 µm in size.
- 5.6. The grades of asphalt binder shall conform to the requirements given in Table 1.