

Standard Specification for Performance Graded Asphalt Binder

AASHTO Designation: MP1-98^{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.

Note 1 -- For asphalt cements graded by penetration at 25°C, see M20. For asphalt cements graded by viscosity at 60°C, see M226.

Note 2 -- Guide PP5 provides information on the evaluation of modified asphalt binders.

Note 3 -- Guide PP6 provides information for determining the performance grade of an asphalt binder.

2. Referenced Documents

2.1 AASHTO Standards:

- MP2 Specification for Superpave Volumetric Mix Design
- MP3 Superpave Software - Volumetric Mix Design
- TP1 Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)
- TP3 Determining the Fracture Properties of Asphalt Binder in Direct Tension (DT)
- TP5 Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)
- PP5 Laboratory Evaluation of Modified Asphalt Systems
- PP6 Grading or Verifying the Performance Grade of an Asphalt Binder
- PP28 Designing Superpave HMA
- M20 Specification for Penetration Graded Asphalt Cement

M226 Specification for Viscosity Graded Asphalt Cement

- PP1 Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)
- T40 Sampling Bituminous Materials
- T44 Solubility of Bituminous Materials in Organic Solvents
- T48 Flash and Fire Points by Cleveland Open Cup
- T55 Water in Petroleum Products and Bituminous Materials
- T201 Kinematic Viscosity of Asphalts
- T202 Viscosity of Asphalts by Vacuum Capillary Viscometer
- T240 Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin Film Oven Test)

2.2 ASTM Standards:

- D8 Standard Definitions of Terms Relating to Materials for Roads and Pavements
- D5546 Standard Test Method for Solubility of Polymer - Modified Asphalt Materials in 1,1,1, Trichloroethane
- D4402 Viscosity Determinations of Unfilled Asphalt Using the Brookfield Thermosel Apparatus

3. Terminology

3.1 Definitions

3.1.1 Definitions for many terms common to asphalt cement are found in ASTM D8.

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.

¹ This standard is based on SHRP Product 1001.

² Approved in October 1993, this provisional standard was first published in January 1994.

4. Ordering Information - 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).

4.1 Asphalt binder grades may be selected by following the procedures described in MP2 and PP28.

5. Materials and Manufacture

5.1 Asphalt cement 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 T44 or D5546.

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.

6. Sampling - The material shall be sampled in accordance with Method T 40.

7. Test Methods - The properties outlined in 5.3, 5.4 and 5.6 shall be determined in accordance with T44, T48, T55, T240, PP1, TP1, TP3, TP5 and ASTM D4402.

8. Inspection and Certification - Inspection and certification of the material shall be agreed upon between the purchaser and the seller. Specific requirements shall be made part of the purchase contract. The seller shall provide material handling and storage procedures to the purchaser for such asphalt binder grade certified.

9. Rejection and Rehearing - If the results of any test do not conform to the requirements of this specification, retesting to determine conformity is performed as indicated in the purchase order or as otherwise agreed upon between the purchaser and the seller.

10. Key Words - Asphalt binder, asphalt cement, modifier, performance specifications, rheology, direct tension, pressure aging, flash point.