



Standard Specification for Type I Polymer Modified Asphalt Cement for Use in Pavement Construction¹

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1. Scope

1.1 This specification covers asphalt cements that have been modified by the addition of an appropriate polymer for use in pavement construction. It was developed to provide a reference for specifying polymer-modified asphalt and reflects the properties of currently available commercial products. This is not intended to be a performance-based specification.

1.2 Type I polymer-modified asphalts are typically made with styrene-butadiene or styrene-butadiene-styrene block copolymers. However, any polymer may be used that will give the required test results when blended with the desired asphalt.

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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:

- D 5 Test Method for Penetration of Bituminous Materials²
- D 36 Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)³
- D 92 Test Method for Flash and Fire Points by Cleveland Open Cup⁴
- D 113 Test Method for Ductility of Bituminous Materials²
- D 140 Practice for Sampling Bituminous Materials²
- D 1754 Test Method for Effect of Heat and Air on Asphaltic Materials (Thin-Film Oven Test)²
- D 2042 Test Method for Solubility of Asphalt Materials in Trichloroethylene²
- D 2170 Test Method for Kinematic Viscosity of Asphalts (Bitumens)²
- D 2872 Test Method for Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin-Film Oven Test)²

¹ This specification is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.45 on Modified Asphalt Specifications.

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² Annual Book of ASTM Standards, Vol 04.03.

³ Annual Book of ASTM Standards, Vol 04.04.

⁴ Annual Book of ASTM Standards, Vol 05.01.

D 4957 Test Method for Apparent Viscosity of Asphalt Emulsion Residues² and Non-Newtonian Bitumens by Vacuum Capillary Viscometer²

E 11 Specification for Wire-Cloth Sieves for Testing Purposes⁵

3. Manufacture

3.1 The asphalt used to prepare the polymer-modified asphalt cement shall be prepared by the refining of crude petroleum by suitable means.

4. Physical Requirements

4.1 The polymer-modified asphalt cement shall be homogeneous and free from water and shall not foam when heated to 175°C (347°F).

4.2 The polymer-modified asphalt cement shall conform to the requirements of Table 1.

4.3 The polymer modifier and asphalt cement shall be compatible and pre-blended prior to use.

5. Methods of Sampling and Testing

5.1 Sample and test the polymer-modified asphalt cement in accordance with the following test methods or practice:

- 5.1.1 *Sampling*—Practice D 140.
- 5.1.2 *Penetration*—Test Method D 5.
- 5.1.3 *Viscosity at 60°C (140°F)*—Test Method D 4957.
- 5.1.4 *Viscosity at 135°C (275°F)*—Test Method D 2170.
- 5.1.5 *Ring and Ball Softening Point*—Test Method D 36.
- 5.1.6 *Flash Point, Cleveland Open Cup*—Test Method D 92.
- 5.1.7 *Rolling Thin Film Oven Test*—Test Method D 2872.
- 5.1.8 *Thin Film Oven Test*—Test Method D 1754.
- 5.1.9 *Solubility*—Test Method D 2042.

6. Test Methods for Type I Polymer-Modified Asphalt Binder

6.1 Summary of Separation Test:

6.1.1 *Scope*—The separation of polymer and asphalt during hot storage is evaluated by comparing the ring and ball softening point of the top and bottom portions taken from a conditioned, sealed tube of polymer-modified asphalt. The

⁵ Annual Book of ASTM Standards, Vol 14.02.