



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

This standard is issued under the fixed designation D 5840; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

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. The tests are intended to measure compatibility and degree of modification, not performance characteristics. This is not intended to be a performance based specification.

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

2. Referenced Documents

2.1 *ASTM Standards:*

D 5 Test Method for Penetration of Bituminous Materials²

D 92 Test Method for Flash and Fire Points by Cleveland Open Cup³

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 2170 Test Method for Kinematic Viscosity of Asphalts (Bitumens)²

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

Current edition approved Dec. 10, 2000. Published February 2001. Originally published as D 5840–95. Last previous edition D 5840–95.

² *Annual Book of ASTM Standards*, Vol 04.03.

³ *Annual Book of ASTM Standards*, Vol 05.01.

D 2872 Test Method for Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin-Film Oven Test)²

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

D 5801 Test Method for Toughness and Tenacity of Bituminous Materials²

3. Physical Requirements

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

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

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

4. Sampling and Test Methods

4.1 Sample and test the polymer modified asphalt cement in accordance with the following test methods and practices.

4.1.1 *Sampling*—Practice D 140.

4.1.2 *Penetration*—Test Method D 5.

4.1.3 *Viscosity at 140°F (60°C)*—Test Method D 4957.

4.1.4 *Viscosity at 275°F (135°C)*—Test Method D 2170.

4.1.5 *Ductility*—Test Method D 113.

4.1.6 *Flash Point, Cleveland Open Cup*—Test Method D 92.

4.1.7 *Rolling Thin-Film Oven Test*—Test Method D 2872.

4.1.8 *Thin-Film Oven Test*—Test Method D 1754.

4.1.9 *Toughness and Tenacity*—Test Method D 5801.

TABLE 1 Physical Property Requirements for Type II Polymer Modified Asphalts

Designation	II-A		II-B		II-C		II-D	
	Min	Max	Min	Max	Min	Max	Min	Max
Tests on Original Product								
Penetration at 77°F (25°C), 100 g, 5 s	100		70		85		80	
Viscosity, 140°F (60°C), 1 ^s - ¹ , poise	800		1600		800		1600	
Viscosity, 275°F (135°C), cSt	300		300		300		300	
Ductility, 39.2°F (4°C), 5 cm/min, cm	50		50		25		25	
Flash Point, COC, °F (°C)	450 (232)		450 (232)		450 (232)		450 (232)	
Toughness, 77°F (25°C), 20 in./min (51 cm/min), in.-lb (mN-m)	75 (8475)		110 (12430)		75 (8475)		110 (12430)	
Tenacity, 77°F (25°C), 20 in./min (51 cm/min), in.-lb (mN-m)	50 (5650)		75 (8475)		50 (5650)		75 (8475)	
Tests on Aged Residue^A								
Ductility, 39.2°F (4°C), 5 cm/min, cm	25		25		10		10	
Viscosity, 140°F (60°C), 1 ^s - ¹ , poise		4000		8000		4000		8000
Toughness, 77°F (25°C), 20 in./min (51 cm/min), in.-lb (mN-m)					75 (8475)		100 (11300)	
Tenacity, 77°F (25°C), 20 in./min (51 cm/min), in.-lb (mN-m)					50 (5650)		75 (8475)	

^A The thin-film oven test or the rolling thin-film test may be used.

The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).