



Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers asphalt cement for use in the construction of pavements.

1.2 This specification covers the following penetration grades:

40–50,	120–150, and
60–70,	200–300.
85–100,	

2. Referenced Documents

2.1 *ASTM Standards*:²

- D 5 Test Method for Penetration of Bituminous Materials
- D 36 Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)
- D 92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester
- D 113 Test Method for Ductility of Bituminous Materials
- D 140 Practice for Sampling Bituminous Materials
- D 1754 Test Method for Effects of Heat and Air on Asphaltic Materials (Thin-Film Oven Test)
- D 2042 Test Method for Solubility of Asphalt Materials in Trichloroethylene

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3. Manufacture

3.1 Asphalt cement shall be prepared by the refining of crude petroleum by suitable methods.

4. Properties

4.1 The asphalt cement shall be homogeneous and shall not foam when heated to 347°F (174°C).

4.2 The asphalt cement shall conform to the requirements given in Table 1 or Table 2, as specified by the purchaser. Table 2 requirements limit the temperature susceptibility of asphalt over Table 1 requirements. Asphalts that meet Table 2 requirements will also meet Table 1 requirements of the same grade.

5. Methods of Sampling and Testing

5.1 The material shall be sampled and the properties enumerated in this specification shall be determined in accordance with the following ASTM methods:

- 5.1.1 *Sampling*—Practice D 140.
- 5.1.2 *Penetration*—Test Method D 5.
- 5.1.3 *Softening Point*—Test Method D 36.
- 5.1.4 *Flash Point*—Test Method D 92.
- 5.1.5 *Ductility*—Test Method D 113.
- 5.1.6 *Thin Film Oven Test*—Test Method D 1754.
- 5.1.7 *Solubility in Trichloroethylene*—Test Method D 2042.

6. Keywords

- 6.1 asphalt cement; pavement; penetration

TABLE 1 Requirements for Asphalt Cement for Use in Pavement Construction

	Penetration Grade									
	40–50		60–70		85–100		120–150		200–300	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Penetration at 77°F (25°C) 100 g, 5 s	40	50	60	70	85	100	120	150	200	300
Flash point, °F (Cleveland open cup)	450	...	450	...	450	...	425	...	350	...
Ductility at 77°F (25°C) 5 cm/min, cm	100	...	100	...	100	...	100	...	100 ^A	...
Solubility in trichloroethylene, %	99.0	...	99.0	...	99.0	...	99.0	...	99.0	...
Retained penetration after thin-film oven test, %	55 +	...	52 +	...	47 +	...	42 +	...	37 +	...
Ductility at 77°F (25°C) 5 cm/min, cm after thin-film oven test test	50	...	75	...	100	...	100 ^A	...

^AIf ductility at 77°F (25°C) is less than 100 cm, material will be accepted if ductility at 60°F (15.5°C) is 100 cm minimum at the pull rate of 5 cm/min.

TABLE 2 Requirements for Penetration Graded Asphalt Cement

	Penetration Grade									
	40–50		60–70		85–100		120–150		200–300	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Penetration at 77°F (25°C) 100 g, 5 s	40	50	60	70	85	100	120	150	200	300
Softening Point, °F (°C)	120 (49)	...	115 (46)	...	108 (42)	...	100 (38)	...	90 (32)	...
Flash point, °F (Cleveland open cup)	450	...	450	...	450	...	425	...	350	...
Ductility at 77°F (25°C) 5 cm/min, cm	100	...	100	...	100	...	100	...	100 ^A	...
Solubility in trichloroethylene, %	99.0	...	99.0	...	99.0	...	99.0	...	99.0	...
Retained penetration after thin-film oven test, %	55 +	...	52 +	...	47 +	...	42 +	...	37 +	...
Ductility at 77°F (25°C) 5 cm/min, cm after thin-film oven test test	50	...	75	...	100	...	100 ^A	...

^AIf ductility at 77°F (25°C) is less than 100 cm, material will be accepted if ductility at 60°F (15.5°C) is 100 cm minimum at the pull rate of 5 cm/min.

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