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Standard Specification for Trinidad Lake Modified Asphalt¹

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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.

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1. Scope

- 1.1 This specification covers Trinidad lake modified asphalt for use in the construction of pavements.
- 1.2 This specification covers the following penetration grades:

40–55
60–75
80–100
120–150

2. Referenced Documents

2.1 *ASTM Standards:*²

- D 5 Test Method for Penetration of Bituminous Materials
- D 92 Test Method for Flash and Fire Points by Cleveland Open Cup
- D 113 Test Method for Ductility of Bituminous Materials
- D 140 Practice for Sampling Bituminous Materials
- D 482 Test Method for Ash from Petroleum Products
- D 1754 Test Method for Effects of Heat and Air on Asphaltic Materials (Thin-Film Oven Test)
- D 1856 Test Method for Recovery of Asphalt From Solution by Abson Method
- D 2042 Test Method for Solubility of Asphalt Materials in Trichloroethylene
- D 2170 Test Method for Kinematic Viscosity of Asphalts (Bitumens)
- D 2172 Test Method for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures

3. Manufacture

3.1 Trinidad lake modified asphalt shall be prepared by blending naturally occurring Trinidad lake asphalt (TLA) (20 to 50 %) with asphalt cement obtained by the refining of crude petroleum by methods suitable to produce a homogeneous final product. The percentage TLA in the blend must be clearly stated by the supplier. Fillers other than those from TLA will not be allowed in the asphalt cement blend.

4. Properties

- 4.1 The blended Trinidad lake modified asphalt shall be homogeneous as determined by appropriate sampling and testing.
- 4.2 The various grades of Trinidad lake modified asphalt shall conform to the requirements prescribed in Table 1.

5. 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 standards:

NOTE 1—Local agencies will determine sampling and testing procedures before a contract is awarded. Methods that have been used include sampling at various levels from storage tanks or transports followed by penetration testing or spectroscopic examination of these samples.

5.1.1 *Sampling*—Practice D 140.

5.1.2 *Penetration*— Test Method D 5.

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*, Vol 04.03, volume information, refer to the standard's Document Summary page on the ASTM website.

TABLE 1 Requirements for Trinidad Lake Modified Asphalt for Use in Pavement Construction

	Penetration Grade							
	min	max	min	max	min	max	min	max
Penetration at 77°F (25°C), 100 g, 5 s	40	55	60	75	80	100	120	150
Kinematic viscosity at 275°F (135°C), cst	385	—	275	—	215	—	175	—
Ductility at 77°F (25°C), 5 cm/min, cm ^{A,B}	—100	—	—100	—	—100	—	—100	—
Ductility at 77°F (25°C), 5 cm/min, cm ^A	100	—	100	—	100	—	100	—
Flash point, °F	450	—	450	—	450	—	450	—
Solubility in trichloroethylene, % ^C	—77	90	—77	90	—77	—90	—77	—90
Solubility in trichloroethylene, % ^B	77	90	77	90	77	90	77	90
Retained penetration after thin-film oven test, %	55	—	52	—	47	—	42	—
Ductility at 77°F (25°C), 5 cm/min, cm, after Thin-Film Oven Test	50	—	50	—	75	—	100	—
Inorganic matter (ash), %	7.5	19.0	7.5	19.0	7.5	19.0	7.5	19.0

^A If original ductility is less than 100 cm, the test shall be repeated on the extracted modified asphalt containing not more than 5 % inorganic ash.

^B If original 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 of 5 cm/min.

^C Solubility requirements to be established by the user, within this range, from targeted percentage of TLA in blend.

5.1.3 *Flash Point*— Test Method D 92.

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

5.1.5 *Solubility in Trichloroethylene* —Test Method D 2042.

5.1.6 *Ductility*—Test Method D 113.

5.1.7 *Inorganic Material (Ash)*—Test Method D 482.

5.1.8 *Quantitative Extraction of Bitumen from Bituminous Paving Mixtures*—Test Method D 2172.

5.1.9 *Recovery of Asphalt from Solution by Abson Method*—Test Method D 1856.

5.1.10 *Kinematic Viscosity of Asphalt* —Test Method D 2170.

APPENDIX

(Nonmandatory Information)

X1. CORRECTION TO MIX FINES TO COMPENSATE FOR FINES IN TRINIDAD LAKE ASPHALT

X1.1 Since Trinidad Lake Asphalt contains some fines, it may be desirable to make a correction to the minus No. 200 (75 μm) fines in the mix to compensate. A formula used by the Utah DOT has been developed based on 36 percent mineral matter with 91.2 percent passing the No. 200 (75 μm) and is included for information.

$$\text{Fines Correction} = 32.83 \times P(B) \times P(T) \tag{X1.1}$$

where:

$P(B)$ = Percent binder in total mix expressed as a decimal, and

$P(T)$ = Percent Trinidad Lake Asphalt in total binder expressed as a decimal.

Example:

If a mix contains 5.8 percent binder by weight of mix and the total binder consists of 25 percent Trinidad Lake Asphalt: Fine contributed by Trinidad Lake Asphalt = 32.83(0.058)(0.25) = 0.48 percent.

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