



Designation: D6626 – 23

Standard Specification for Performance-Graded Trinidad Lake Modified Asphalt Binder¹

This standard is issued under the fixed designation D6626; 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 performance-graded Trinidad Lake modified asphalt binders. Grading designations are related to the LTPPBind Online calculated maximum pavement design temperature and the minimum pavement design temperature.

NOTE 1—For more information on LTPPBind Online, see <https://infopave.fhwa.dot.gov/Tools/LTPPBindOnline> accessed July 10, 2023.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- D8 Terminology Relating to Materials for Roads and Pavements
- D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester
- D95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation
- D140/D140M Practice for Sampling Asphalt Materials
- D1754/D1754M Test Method for Effects of Heat and Air on Asphaltic Materials (Thin-Film Oven Test)
- D2042 Test Method for Solubility of Asphalt Materials in Trichloroethylene or Toluene
- D2872 Test Method for Effect of Heat and Air on a Moving Film of Asphalt Binder (Rolling Thin-Film Oven Test)

¹ This specification is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.40 on Asphalt Specifications.

Current edition approved Dec. 15, 2023. Published December 2023. Originally approved 2001. Last previous edition approved in 2021 as D6626 – 15 (2021). DOI: 10.1520/D6626-23.

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.

- D4402/D4402M Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer
- D6521 Practice for Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)
- D6648 Test Method for Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)
- D6723 Test Method for Determining the Fracture Properties of Asphalt Binder in Direct Tension (DT) (Withdrawn 2021)³
- D7175 Test Method for Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer
- D7553 Test Method for Solubility of Asphalt Materials in N-Propyl Bromide

3. Terminology

3.1 Definitions:

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

4. Ordering Information

4.1 When ordering under this specification, include in the purchase order the grade of Trinidad Lake modified asphalt binder required from Table 1 (for example, TLG 52-16 or TLG 64-34).

5. Materials and Manufacture

5.1 Trinidad Lake modified asphalt binder shall be prepared by the addition of Trinidad Lake asphalt modifier to base asphalt produced from the refining of petroleum crude, with or without the inclusion of organic or inorganic modifiers.

5.2 Modifiers may be any suitable form of Trinidad Lake asphalt that may include also organic or inorganic modifiers of suitable manufacture and preparation, and that is dissolved, dispersed, or reacted in asphalt cement to enhance its performance.

5.3 The base asphalt binder shall be homogeneous, free from water and deleterious materials, and shall not foam when heated to 175 °C.

³ The last approved version of this historical standard is referenced on www.astm.org.

TABLE 1 Performance-Graded Trinidad Lake Modified Asphalt Binder Specification

Performance Grade	TLG 46-			TLG 52-			TLG 58-			TLG 64-			TLG 70-			TLG 76-			TLG 82-							
	34	40	46	10	16	22	28	34	40	10	16	22	28	34	40	10	16	22	28	34	40					
LTPPBnd algorithm max Pavement Design Temperature, °C	<46			<52			<58			<64			<70			<76			<82							
Minimum Pavement Design Temperature, °C ^A	>-34 >-40 >-46			>-10 >-16 >-22 >-28 >-34 >-40 >-46			>-16 >-22 >-28 >-34 >-40 >-46			>-10 >-16 >-22 >-28 >-34 >-40 >-46			>-10 >-16 >-22 >-28 >-34 >-40 >-46			>-10 >-16 >-22 >-28 >-34 >-40 >-46										
Original Modified Asphalt Binder																										
230																										
Flash Point Temp, Test Method D92 ; min °C																										
Solubility, Test Method D2042 or D7553 , %	77-90																									
135																										
Viscosity, Test Method D4402/D4402M ; ^B max, 3 Pa·s, Test Temp, °C																										
Dynamic Shear, D7175 ; ^C G'/sinδ, min, 1.00 kPa Test Temp at 10 rad/s, °C	46			52			58			64			70			76			82							
Rolling Thin Film Oven (Test Method D2872)																										
1.00																										
Mass Loss, max, percent																										
Dynamic Shear, D7175 ; G'/sinδ, min, 2.20 kPa Test Temp at 10 rad/s, °C	46			52			58			64			70			76			82							
Pressure Aging Vessel Residue (Practice D6521)																										
PAV Conditioning Temp, °C ^D	90			90			100			100			100			100			100							
Dynamic Shear, D7175 : G·sinδ, ^E max, 6000 kPa Test Temp at 10 rad/s, °C	10	7	4	25	22	19	16	13	13	10	7	31	28	25	22	19	16	34	31	28	25	40	37	34	31	28
Report																										
Physical Hardening ^F																										
Creep Stiffness, D6648 ; ^G S _i , Maximum, 300 MPa m-value, min, 0.300 Test Temp at 60 s, °C	-24	-30	-36	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24
Direct Tension, D6723 ; ^G Failure Strain, min, 1 % @ 1.0 mm/min, °C	-24	-30	-36	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24

^A Pavement temperatures are estimated from air temperatures using an algorithm contained in the LTPPBnd Online software program, or are provided by the specifying agency.

^B This requirement may be waived at the discretion of the specifying agency if the supplier warrants that the asphalt binder can be adequately pumped and mixed at temperatures that meet all applicable safety standards. The mass change shall be less than 1.00 % for either a positive (mass gain) or a negative (mass loss) change.

^C For climates with LTPPBnd high pavement temperature of 76 or above, the PAV conditioning temperature shall be 110 °C.

^D If the intermediate temperature stiffness, G* sinδ, is below 5000 kPa, the phase angle minimum limit is not required. If the intermediate temperature stiffness, G* sinδ, is between 5000 and 6000 kPa, the intermediate phase angle minimum limit is required.

^E Physical Hardening—Test Method D6648 is performed on a set of asphalt beams according to section 13.1, except the conditioning time is extended to 24 h ± 10 min at 10 °C above the minimum performance temperature. The 24 h stiffness and m-value are reported for information purposes only.

^F If the creep stiffness is below 300 MPa, the direct tension test is not required. If the creep stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used in lieu of the creep stiffness requirement. The m-value requirement must be satisfied in both cases.