Designation: D3791/D3791M – 11 (Reapproved 2018)

Standard Practice for Evaluating the Effects of Heat on Asphalts[1]

This standard is issued under the fixed designation D3791/D3791M; 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 practice covers a procedure for evaluating some of the effects on asphalts of heating in the presence of little or no air.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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]

D5/D5M Test Method for Penetration of Bituminous Materials

D36/D36M Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)

D140/D140M Practice for Sampling Asphalt Materials

D1079 Terminology Relating to Roofing and Waterproofing

D2170/D2170M Test Method for Kinematic Viscosity of Asphalts (Bitumens)

D2171/D2171M Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer

D4402/D4402M Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer

E1 Specification for ASTM Liquid-in-Glass Thermometers

E145 Specification for Gravity-Convection and Forced-Ventilation Ovens

E230/E230M Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples

E1137/E1137M Specification for Industrial Platinum Resistance Thermometers

3. Terminology

3.1 *Definitions*—Definitions of terms used in this practice can be found in Terminology D1079.

4. Summary of Practice

4.1 A sample of asphalt in a loosely covered container is heated to a temperature chosen by the investigator for a period of 5 h ± 10 min. Certain characteristics of the asphalt after heat exposure at the test temperature chosen are then compared with those characteristics before exposure.

NOTE 1—A set temperature is required when this practice is used as part of a specification. Historically, a temperature of 204°C [400°F] has been used.

5. Significance and Use

5.1 When asphalts are maintained at elevated temperatures in the presence of air, their characteristics may change. Certain blown asphalts also soften when maintained near, and particularly above, their final blowing temperatures under virtually air-free conditions. This may happen if the asphalt is overheated for application purposes. This practice provides a uniform heat-treatment procedure and methods for evaluating the effect of this treatment on some of the characteristics of asphalts. Changes observed when asphalts are overheated are not indicative of changes to be expected when asphalts are heated to normal application temperatures.

6. Apparatus

6.1 *Oven*—A forced-ventilation oven conforming to the requirements for Type IIA as prescribed in Specification E145,

[1] This practice is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.03 on Surfacing and Bituminous Materials for Membrane Waterproofing and Built-up Roofing.

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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.