Designation: D8051/D8051M – 16 (Reapproved 2023)

Standard Specification for Wax-Modified Asphalt Used in Roofing[1]

This standard is issued under the fixed designation D8051/D8051M; 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 wax-modified asphaltic products intended for use in built-up roof construction, construction of bituminous vapor retarder systems, adhering fleece-backed single-ply roof membranes, and adhering insulation boards used in various types of roof systems. The specification is intended for general classification purposes only, and does not imply restrictions on roofing system design, such as the slope at which this asphalt may be used.

1.2 These products have lower application temperatures compared to products specified by Specification D312/D312M.

1.3 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 nonconformance with the standard.

1.4 *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.*

1.5 *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)

D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester

D113 Test Method for Ductility of Asphalt Materials

D140/D140M Practice for Sampling Asphalt Materials

D312/D312M Specification for Asphalt Used in Roofing

D1079 Terminology Relating to Roofing and Waterproofing

D2042 Test Method for Solubility of Asphalt Materials in Trichloroethylene or Toluene

D3461 Test Method for Softening Point of Asphalt and Pitch (Mettler Cup-and-Ball Method)

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

D7553 Test Method for Solubility of Asphalt Materials in N-Propyl Bromide

3. Terminology

3.1 For definitions of terms used in this specification, refer to Terminology D1079.

3.2 *Definitions:*

3.2.1 *high-melt-point synthetic wax, n*—synthetic wax with a melt point greater than 90 °C, for example polyethylene wax, oxidized polyethylene wax, Fischer-Tropsch wax, and ethylene bis stearamide wax.

3.2.2 *lightly oxidized asphalt, n*—having a softening point and penetration range as defined in Table 1.

3.2.3 *wax-modified asphalt (WM), n*—a product made by modifying a lightly oxidized asphalt with a high-melt-point synthetic wax.

4. Materials and Manufacture

4.1 The base asphalt shall be prepared from lightly oxidized petroleum asphalt.

4.2 The wax-modified asphalt shall incorporate one or more high-melt-point synthetic waxes in order to meet the requirements of this specification.

5. Physical Properties

5.1 The products shall be homogeneous and free of water.

5.2 The products of each type shall conform to the physical properties prescribed in Table 1.

[1] This specification 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.

Current edition approved June 1, 2023. Published June 2023. Originally approved in 2016. Last previous edition approved in 2016 as D8051/D8051M – 16. DOI: 10.1520/D8051_D8051M-16R23.

[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.

TABLE 1 Physical Requirements of Wax-Modified Asphalt for Use in Roofing

Property	Min	Max
Oxidized Base Asphalt before Modification		
Softening Point, °C [°F]	60 [140]	70 [158]
Penetration at 25 °C [77 °F], dmm	20	30
Final Product after Modification		
Softening Point, °C [°F]	99 [210]	110 [230]
Flash Point, °C [°F]	260 [500]	
Penetration, dmm		
at 0 °C [32 °F]	6	
at 25 °C [77 °F]	12	30
at 46 °C [115 °F]		75
Ductility at 25 °C [77 °F], cm	4	
Solubility %	95	
EVT, °C [°F]		
at 125 cPs		193 [380]
at 75 cPs		210 [410]

6. Sampling and Test Methods

6.1 Sample the material and determine the properties enumerated in this specification in accordance with the following methods:

6.1.1 *Sampling*—Practice D140/D140M.

6.1.2 *Softening Point*—See Test Method D36/D36M or D3461. In cases where a disagreement exists between the purchaser and the seller, Test Method D36/D36M shall be used as the referee method.

6.1.3 *Flash Point*—Test Method D92.

6.1.4 *Penetration*—Test Method D5/D5M.

6.1.5 *Ductility*—Test Method D113.

6.1.6 *Solubility*—Test Method D2042 or Test Method D7553. In cases where a disagreement exists between the purchaser and the seller, Test Method D2042 shall be used as the referee method.

6.1.7 *EVT*—Test Method D4402/D4402M is used to determine what temperatures result in the viscosity values that define EVT for mopping and mechanical application.

7. Inspection

7.1 Inspection of the material shall be agreed upon between the purchaser and the seller as part of the purchase contract.

8. Rejection and Rehearing

8.1 Failure to conform to any of the requirements prescribed in this specification shall constitute grounds for rejection. In case of rejection, the seller shall have the right to re-inspect the rejected material and resubmit the lot after removal of those packages not conforming to the requirements.

9. Packaging and Package Marking

9.1 The asphalt product shall be suitably packaged (if not shipped in bulk) to permit acceptance by the carrier and to afford adequate protection from the normal hazards of handling and shipment.

9.2 Each container or bill of lading on bulk shipments shall be plainly marked with the name of the manufacturer or seller, the ASTM designation, maximum kettle temperature of 246 °C [475 °F], and the lot specific equiviscous temperature (EVT) for mop and for mechanical spreader application.

10. Keywords

10.1 asphalt; built-up roof; equiviscous temperature; roofing; softening point; synthetic wax; wax-modified asphalt

APPENDIX

(Nonmandatory Information)

X1. APPLICATION GUIDE AND BENEFITS

X1.1 For built-up membrane construction, asphalt should be applied within the EVT application range for asphalt described in Terminology D1079.

X1.2 At no time should the kettle temperature exceed 246 °C [475 °F].