



Designation: D2178/D2178M – 15a (Reapproved 2021)

# Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing<sup>1</sup>

This standard is issued under the fixed designation D2178/D2178M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

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

## 1. Scope

1.1 This specification covers glass felts impregnated with varying degrees with asphalt intended to be used with asphalts conforming to the requirements of Specification [D312/D312M](#) or [D7654/D7654M](#) in the construction of built-up roofs, and with asphalts conforming to the requirements of Specification [D449/D449M](#) in the construction of waterproofing systems.

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 nonconformance 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:*<sup>2</sup>

- [D146/D146M Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing](#)
- [D312/D312M Specification for Asphalt Used in Roofing](#)
- [D449/D449M Specification for Asphalt Used in Dampproof-](#)

[ing and Waterproofing](#)

- [D1079 Terminology Relating to Roofing and Waterproofing](#)
- [D7654/D7654M Specification for Asphalt Used in Roofing Measured by Dynamic Shear Rheometer](#)

## 3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this specification, refer to Terminology [D1079](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *net dry mass*—the mass of the asphalt-impregnated glass felt exclusive of wrapping and packing material, after drying to constant weight and after removing all detached comminuted surfacing material as described in [8.2](#).

## 4. Classification

4.1 Asphalt-impregnated glass felts Types IV and VI are covered by this specification.

## 5. Materials and Manufacture

5.1 The felt shall be a thin, porous sheet of uniformly distributed glass fibers, with or without the addition of reinforcing stranded glass yarns, and bonded with a water-resistant resinous binder.

5.2 In the process of manufacture, the felt shall be impregnated with asphalt which shall be permitted to contain a mineral stabilizer so that the individual glass fibers are coated and the asphalt is evenly distributed throughout.

5.3 The impregnated glass felt shall be surfaced with a material to prevent sticking in the roll. The nature and quantity of the surfacing material shall not interfere with adhesion between the plies of a membrane.

## 6. Physical Properties, Dimensions, Masses, and Permissible Variations

6.1 The finished product shall conform to the physical properties, dimensions, masses, and permissible variations as prescribed in [Tables 1 and 2](#).

6.2 The finished product shall not crack nor be so sticky as to cause tearing or other damage upon being unrolled at temperatures between 10 and 60 °C [50 and 140 °F].

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.04 on Felts, Fabrics and Bituminous Sheet Materials.

Current edition approved July 1, 2021. Published July 2021. Originally approved in 1963. Last previous edition approved in 2015 as D2178/D2178M – 15a. DOI: 10.1520/D2178\_D2178M-15AR21.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto: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 Properties of Asphalt Glass Felt**

	Type IV	Type VI
Breaking strength, <sup>A</sup> min, kN/m [lbf/in.]:		
Longitudinal (with the fiber grain)	7.7 [44]	10.5 [60]
Transverse (across the fiber grain)	7.7 [44]	10.5 [60]
Pliability, 13-mm [½-in.] radius bend	no failures	no failures

<sup>A</sup> To prevent the asphalt-impregnated glass felt from slipping from between the jaws of the tension testing machine, insert a thin strip of soft gasket rubber between the felt and each of the four jaw faces of the machine.

6.3 After extraction of the asphalt in accordance with Section 16 of Test Methods **D146/D146M**, the desaturated felt shall remain flat and unbuckled, shall retain its original shape and dimensions, and individual fibers shall remain firmly set in place.

6.4 The pliability specimen shall be conditioned in air at 25 ± 1 °C [77 ± 2 °F], 50 ± 5 % relative humidity, for at least 1 h and tested in a room maintained at the same temperature (immersion in water not required). Otherwise, follow Test Methods **D146/D146M**, the paragraph on felts in the Pliability section.

## 7. Workmanship, Finish, and Appearance

7.1 The finished material shall be uniformly impregnated with asphalt of uniform thickness, and shall be free of visible defects such as ragged or untrue edges, breaks, cracks, tears, and protuberances.

7.2 Type IV shall contain closely spaced pinholes not over 0.8 mm [⅓ in.] in diameter over the entire area of the felt. Individual holes up to 6.4 mm [¼ in.] in diameter shall be permitted, provided that no more than five such holes are found in any 1.0 m<sup>2</sup> [1.2 yd<sup>2</sup>] of felt.

7.3 Type VI shall be permitted to contain closely spaced holes over the entire area of the felt up to 3 mm [⅛ in.] in diameter.

7.4 The finished material shall be furnished with laying lines, which shall be clearly visible during application of the roof, and spaced at appropriate distances apart to provide for application of built-up roofs with the appropriate number of plies.

7.4.1 The positions of the laying lines, measured from the edge of the sheet to the center of the line, shall not deviate more than 6 mm [¼ in.] from the positions specified by the manufacturer to provide the appropriate number of plies on the roof.

## 8. Sampling and Test Methods

8.1 Sample the material and determine the properties enumerated in this specification in accordance with Test Methods

**D146/D146M**, except for the net dry mass of asphalt-impregnated glass felt.

8.2 *Net Dry Mass of Asphalt-Impregnated Glass Felt*—Cut a representative sample from the full width of each sample roll as described in Section 10 of Test Methods **D146/D146M**. Suspend the samples vertically and allow them to dry to constant weight. Remove the detached comminuted surfacing as described in Section 11 of Test Methods **D146/D146M**. Then weigh each sample of felt and calculate the individual and average net dry mass per unit area.

8.3 *Ash*—Determine ash of the desaturated glass felt by ignition at 538 ± 14 °C [1000 ± 25 °F] for not less than 10 min.

## 9. Inspection

9.1 *Inspection*—Inspection shall be in accordance with the requirements of this specification.

9.2 *Inspection Alternatives*—Alternative inspection requirements shall be determined by and as agreed upon between the purchaser and the supplier.

## 10. Rejection and Resubmittal

10.1 *Failure to Conform*—Failure to conform to any of the requirements as stated in this specification constitutes grounds for rejection.

10.2 *Rejection Redress*—The supplier shall have the right to inspect the rejected materials. The supplier and the purchaser shall agree to the quantity of rolls deemed unacceptable. The supplier shall then have the right to submit the same number of new rolls as replacement.

## 11. Packaging and Package Marking

11.1 Unless otherwise agreed upon between the supplier and purchaser, each product package shall be plainly marked with the supplier's name, product brand, ASTM designation, and type of bitumen if not evident in the label name of the product.

11.2 The rolls shall be securely wrapped or banded in a manner that completely encircles the roll and will prevent slipping or unrolling.

11.3 No roll shall contain more than two pieces, and no more than 3 % of the rolls in any lot shall contain two pieces. If a roll contains a manufacturing splice, the splice shall be clearly marked.

## 12. Keywords

12.1 asphalt; built-up roofs; glass felt; waterproofing