



Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing¹

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 (ϵ) indicates an editorial change since the last revision or reapproval.

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

1. Scope

1.1 This specification covers glass felts impregnated to varying degrees with asphalt intended to be used with asphalts conforming to the requirements of Specification D312 in the construction of built-up roofs, and with asphalts conforming to the requirements of Specification D449 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 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- D146 Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing
- D312 Specification for Asphalt Used in Roofing
- D449 Specification for Asphalt Used in Dampproofing and Waterproofing
- D1079 Terminology Relating to Roofing and Waterproofing

3. Terminology

3.1 Definitions:

¹ 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.

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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.

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, and Masses

6.1 The material shall conform to the physical properties, dimensions, and masses prescribed in Table 1 and Table 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].

6.3 After extraction of the asphalt in accordance with Section 16 of Test Methods D146, 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



TABLE 1 Physical Properties of Asphalt Glass Felt

	Type IV	Type VI
Breaking strength, ^A 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 [$\frac{1}{2}$ -in.] radius bend	no failures	no failures

^A 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.

(immersion in water not required). Otherwise, follow Test Methods D146, 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 [$\frac{1}{32}$ in.] in diameter over the entire area of the felt. Individual holes up to 6.4 mm [$\frac{1}{4}$ in.] in diameter shall be permitted, provided that no more than five such holes are found in any 1.0 m² [1.2 yd²] 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 [$\frac{1}{8}$ in.] in diameter.

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

8. Sampling and Test Methods

8.1 Sample the material and determine the properties enumerated in this specification in accordance with Test Methods D146, 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. 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. Then weigh each sample of felt and calculate the individual and average net dry mass per unit area.

8.3 *Ash*—Determine ash by ignition at $538 \pm 14^\circ\text{C}$ [$1000 \pm 25^\circ\text{F}$] 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

TABLE 2 Dimensions and Masses of Asphalt Glass Felt^A

	Type IV	Type VI
Width of roll, mm [in.], or as agreed between purchaser and supplier	914 [36] ± 0.7 %	914 [36] ± 0.7 %
Area of roll, min, m ² [ft ²], or as agreed between purchaser and supplier	50.17 [540]	50.17 [540]
Net dry mass of asphalt-impregnated glass felt, min, g/m ² [lb/100 ft ²]		
Average of all rolls		
Nonmineral parting agent	303 [6.2]	303 [6.2]
Mineral parting agent	342 [7.0]	342 [7.0]
Individual rolls	293 [6.0]	293 [6.0]
Moisture at point of manufacture, %, max ^A	1.0	1.0
Mass of desaturated glass felt, min, g/m ² [lb/100 ft ²]	83 [1.7]	93 [1.9]
Bituminous saturant (asphalt), min, g/m ² [lb/100 ft ²]	146 [3.0]	146 [3.0]
Ash, %	70 to 88	70 to 88
Parting agent and stabilizer, max, g/m ² [lb/100 ft ²]	156 [3.2]	146 [3.0]

^A At time of manufacture. Products with higher moisture content at time of installation may cause hot materials to foam, creating interply voids that may result in blisters.

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