



Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing¹

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

1. Scope

1.1 This specification covers asphalt-saturated organic felts, with or without perforations, intended to be used with asphalts conforming to the requirements of Specification D 312 in the construction of built-up roofs, and with asphalts conforming to the requirements of Specification D 449 in the construction of water proofing systems.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 The following safety hazards caveat pertains only to the test method portion, Section 8, of this specification: *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:

- D 70 Test Method for Specific Gravity and Density of Semi-Solid Bituminous Materials²
- D 146 Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing³
- D 312 Specification for Asphalt Used in Roofing³
- D 449 Specification for Asphalt Used in Dampproofing and Waterproofing³
- D 727 Test Method for Kerosine Number of Roofing and Flooring Felt by the Vacuum Method⁴
- D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials³

¹ This specification is under the jurisdiction of ASTM Committee D-8 on Roofing, Waterproofing, and Bituminous Materials and is the direct responsibility of Subcommittee D08.04 on Felts and Fabrics for Bituminous Roofing and Waterproofing.

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² *Annual Book of ASTM Standards*, Vol 04.03.

³ *Annual Book of ASTM Standards*, Vol 04.04.

⁴ *Annual Book of ASTM Standards*, Vol 15.09.

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, refer to Terminology D 1079.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *lot—for the purpose of sampling*, a lot shall consist of the same type and size of roofing felt offered for delivery at one time.

4. Classification

4.1 Asphalt-saturated felts covered by this specification are of two types:

4.1.1 *Type I*—Commonly called No. 15 asphalt felt.

4.1.2 *Type II*—Commonly called No. 30 asphalt felt.

5. Materials and Manufacture

5.1 In the process of manufacture a single thickness of dry felt shall be saturated with an asphaltic saturant.

5.2 The felt shall be produced principally from organic fibers. The surface of the felt shall be uniform and relatively smooth. Upon splitting or tearing on the bias, the felt shall appear reasonably free of lumps or particles of foreign substances.

6. Physical Requirements

6.1 The material shall conform to the physical requirements prescribed in Table 1 and the dimensions and masses prescribed in 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 50 and 140°F (10 and 60°C).

6.3 Perforated felts shall conform to the same requirements as the plain type but shall also have uniformly spaced perforations.

7. Workmanship, Finish, and Appearance

7.1 The felt shall be thoroughly and uniformly saturated, and shall show no unsaturated spots at any point upon cutting 2-in. (50-mm) wide strips at random across the entire sheet and splitting them open for their full length.

7.2 The surface of the felt shall not be coated or covered with talc or other substance that would tend to interfere with

TABLE 1 Physical Requirements of Asphalt-Saturated Roofing Felt

	Type I	Type II
Average breaking strength, min, lbf/in. (kN/m) of width:		
With fiber grain	30 (5.25)	40 (7.00)
Across fiber grain	15 (2.63)	20 (3.50)
Pliability at 77°F (25°C)		
The ten strips tested shall not crack when bent 90° at a uniform speed over a rounded corner of:	½-in. (12.7-mm) radius	¾-in. (19.1-mm) radius
Loss on heating at 221°F (105°C) for 5 h, max, %	4	4

TABLE 2 Dimensions and Masses of Asphalt-Saturated Roofing Felt

	Type I	Type II
Width of roll, in. (mm)	36 (914) ± 0.7 % or as agreed upon by purchaser and seller	
Area of roll, min, ft ² (m ²)	216 (20.07) or 432 (40.14) ^A	216 (20.07) ^A
Moisture, at point of manufacture, max % ^B	4.3	4.1
Net mass of saturated felt, min, lb/100 ft ² (g/m ²)	11.5 (560)	26 (1270)
Mass of saturant, min, lb/100 ft ² (g/m ²) ^C	6.2 (303)	15.0 (732)
Mass of desaturated felt, min, lb/100 ft ² (g/m ²)	5.2 (254)	10.0 (488)
Ash, max, %	10.0	10.0
Perforated felt, avg, area of individual hole, max, in. ² (mm ²)	0.05 (32)	...
Average venting area, min, %	0.1	...

^A Other areas as agreed upon by purchaser and seller.

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

^C The mass of saturant shall not be less than 1.2 times the mass of the dry felt for Type I with a saturation efficiency of not less than 70%. The mass of the saturant shall not be less than 1.50 times the mass of dry felt for Type II.

adhesion between the felt and plying cement or bitumen.

7.3 The finished material shall be free of visible external defects, such as holes, ragged or untrue edges, breaks, cracks, tears, protuberances and indentations, except for intentionally provided perforations and the associated protuberances.

8. Sampling and Test Methods

8.1 Sample the material and determine the properties enumerated in this specification in accordance with Test Methods D 146.

8.2 Determine the openness of the perforations in saturated felts by the following method:

8.2.1 Cut three adjacent 12-in. (305-mm) ± 0.5 % square specimens across the width of the felt. Determine the number of perforations per specimen by multiplying the number of perforations per row by the number of rows. Correct for differences when rows are off-set from each other. Calculate the average number of perforations per specimen, *P*.

8.2.2 Place the specimen on a sheet of white paper with the smoother side up (side from which the needling or perforating device enters the felt). Use a 2-in. (50-mm) wide natural or nylon bristle paint brush to apply uniformly 1 to 1¼ in.³ (15 to 20 cm³) of SAE No. 10 or 10W grade motor oil to each specimen. Apply the oil with smooth strokes and without undue pressure on the brush. Complete the initial application in 1 min and continue to brush out the oil on the surface for an additional minute.

8.2.3 Lift the perforated felt from the paper upon completion of brushing and count the oil spots showing on the white paper beneath as open perforations. Calculate the percent of open holes, *H*, on the basis of the total number of holes determined in 8.2.1. Average the results of three determinations and report.

8.2.4 Measure the size of the perforations using an optical comparator. If round, record diameter of the holes. If square or rectangular, record appropriate dimensions. Calculate the av-

erage area, *A*, of the perforations.

8.2.5 Determine the average venting area as follows:

$$V = \frac{P \times A \times H}{S} \quad (1)$$

where:

V = vented area, %

P = average number of perforations per specimen,

A = average area at one hole, in.² (mm²),

H = average open holes, %, and

S = average specimen area, in.² (mm²).

8.2.6 No statement is made about either the precision or the bias of this method of determining the openness of the perforations in saturated felts since the result merely states whether there is conformance to the criteria for success specified in the procedure.

8.3 Determine the saturation percent and saturation efficiency by the following method:

8.3.1 Calculate the percent saturation by dividing the mass of the saturant by the mass of the desaturated (dry) felt, and multiply the result by 100.

8.3.2 Determine the kerosine number of the desaturated (dry) felt in accordance with Test Method D 727.

8.3.3 Calculate the saturation efficiency by dividing the percent saturation of the product by the kerosine number times the specific gravity of the saturant, and multiply the result by 100. A suitable method for determining the specific gravity of bitumen is Test Method D 70.

8.3.4 The precision and bias of this method for measuring kerosine value are as specified in Test Method D 727, Section 11.

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, the product brand, the 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; organic felt; waterproofing

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