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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Smooth-Surfaced Asphalt Roll Roofing (Organic Felt)[1]

This standard is issued under the fixed designation D 224; 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 asphalt roofing in sheet form, composed of organic roofing felt, saturated with asphalt and coated on both sides with an asphaltic compound which may or may not contain mineral stabilizer, and surfaced with powdered talc, mica, or other fine mineral matter to prevent sticking.

1.2 *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 146 Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing[2]

D 228 Test Methods for Asphalt Roll Roofing, Cap Sheets, and Shingles[2]

D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials[2]

E 96 Test Methods for Water Vapor Transmission of Materials[3]

3. Terminology

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

4. Classification

4.1 *Type I*—Minimum net mass per unit area of roofing, 39.8 lb/100 ft^2 (1943 g/m^2).

4.2 *Type II*—Minimum net mass per unit area of roofing, 54.6 lb/100 ft^2 (2666 g/m^2).

4.3 *Type III*—Minimum net mass per unit area of roofing, 51.1 lb/100 ft^2 (2495 g/m^2).

4.4 *Type IV*—Minimum net mass per unit area of roofing, 39.8 lb/100 ft^2 (1943 g/m^2).

5. Materials and Manufacture

5.1 In the process of manufacture, a single thickness of dry organic felt shall be impregnated with an asphaltic saturant, then coated on both sides with asphaltic coating which may be compounded with a fine mineral stabilizer substantially insoluble in water, and finally surfaced on one side with fine mineral matter to prevent sticking in the roll.

5.2 The felt shall be roofing felt primarily composed of organic fibers. The surface of the felt shall be uniformly 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 fabricated product shall conform to the requirements prescribed in Table 1.

6.2 *Pliability at 77°F (25°C)*—At least eight strips out of ten shall not crack when tested in accordance with Section 16 of Test Methods D 228.

6.3 *Behavior on Heating to 176°F (80°C) for 2 h*—There shall be not more than 1.5 % volatile loss; and there shall be no flowing, sagging, blistering, or absorption of the asphalt coating when tested in accordance with Section 18 of Test Methods D 228.

6.4 Upon being unrolled, the finished product shall not crack at ambient temperatures above 50°F (10°C) nor be so sticky at any temperature below 140°F (60°C) as to cause tearing or material damage.

7. Dimensions, Masses, and Permissible Variations

7.1 *Width*—The roofing shall be put up in rolls and shall be 36 in. (914 mm) wide or other widths as agreed upon by the buyer and the seller ± 0.7 %.

7.2 *Area*—The average area of the rolls examined shall contain not less than 108 or 216 ft^2 (10.0 or 20.1 m^2) as specified, which shall be sufficient to cover 100 or 200 ft^2 (9.3 or 18.6 m^2) respectively, of the roof surface.

7.3 *Mass*—The roofing shall conform to the masses prescribed in Table 2.

8. Workmanship, Finish, and Appearance

8.1 The felt shall be completely and uniformly saturated, and shall show no unsaturated spots at any point upon cutting 2-in. (51-mm) wide strips at random across the entire sheet and splitting them open for their full length.

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[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 D08.02 on Prepared Roofings, Shingles, and Siding Materials.

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[2] *Annual Book of ASTM Standards*, Vol 04.04.

[3] *Annual Book of ASTM Standards*, Vol 04.06.

TABLE 1 Physical Requirements of Asphalt Roll Roofing

	Types I and IV	Types II and III
Breaking strength with fiber grain, min, lbf/in. (kN/m) of width	35 (6.1)	45 (7.9)
Water vapor transmission (permeance), max grains/h·ft^2·in. Hg (ng/Pa·s·m^2)	0.5 (29)	0.5 (29)

8.2 The coating shall be applied uniformly to each side and up to the edges of the sheet. It may be smooth or veined.

8.3 The top side of the sheet shall be surfaced with fine mineral surfacing.

8.4 The reverse side may be surfaced with any suitable material to prevent the roofing from sticking in the package. If soap or other materials are used as the backing, the amount applied shall not be so great as to hinder proper adhesion between plies.

8.5 The finished material shall be free of visible defects such as holes, ragged or untrue edges, breaks, cracks, tears, protuberances, and indentations.

9. Sampling and Test Methods

9.1 Sample the material and determine the properties enumerated in this specification in accordance with Test Methods D 228.

9.2 Determine the breaking strength and moisture content in accordance with Test Methods D 146.

9.3 Determine the permeance in accordance with Test Methods E 96, Procedure B.

10. Inspection

10.1 Inspection of material shall be made as agreed upon by the purchaser and the seller as part of the purchase contract.

11. Rejection and Resubmittal

11.1 Failure to conform to any one of the requirements prescribed in this specification shall constitute grounds for rejection. In case of rejection, the seller shall have the right to reinspect the rejected shipment and resubmit the lot after removal of those packages not conforming to the specified requirements.

12. Packaging and Marking

12.1 The roofing shall be put up in rolls of either 108 or 216 ft^2 (10.0 or 20.1 m^2). No roll shall contain more than two pieces nor shall there be more than 3 % of rolls containing two pieces in any shipment.

12.2 The rolls shall be tightly wound and shall be securely wrapped in a substantial grade of paper completely encircling the roll and pasted at the overlap in such a manner as to prevent shifting from position.

12.3 Special packaging shall be as agreed upon by the purchaser and the seller.

12.4 Each roll shall be plainly marked with the name and brand of the manufacturer and the ASTM designation of the product.

TABLE 2 Masses of Asphalt Roll Roofing

	Type I	Type II	Type III	Type IV
Minimum net mass, lb/100 ft^2 (g/m^2)	39.8 (1943)	54.6 (2666)	51.1 (2495)	39.8 (1943)
Mass of desaturated, moisture-free felt, min, lb/100 ft^2(g/m^2)	5.2 (250)	10.0 (488)	9.0 (440)	250 (5.2)
Mass of asphalt saturant soluble in trichloroethylene, based on the mass of the desaturated, moisture-free felt, min, %[A,B]	140	160	150	120
Mass of coating and surfacing (both sides), min, lb/100 ft^2(g/m^2)	18.0 (879)	18.0 (879)	18.0 (879)	879 (18.0)
Mass of mineral matter passing a 212-µm (No. 70) sieve, based on the mass of the coating and surfacing (both sides), max, %	60	60	60	60
Moisture, at time of manufacture, max, mass, %	3	3	3	3

[A]Test for compliance to this specification prior to installation. Types may not be differentiated after installation.
[B]The mass of saturant shall not be less than 1.2 times the mass of the dry felt for Type IV with a saturation efficiency of not less than 70 %.