



Designation: **D 227 – 97a03**

Standard Specification for Coal-Tar-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. This specification replaces Federal specification HH-R-595, Type 15C.

1. Scope

1.1 This specification covers coal-tar-saturated organic felt intended to be used with coal-tar pitches conforming to the appropriate requirements of Specification D 450 in the construction of built-up roofs and in the construction of waterproofing systems.

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

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

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2. Referenced Documents

2.1 ASTM Standards:²

- D 146 Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing
- D 450 Specification for Coal-Tar Pitch Used in Roofing, Dampproofing, and Waterproofing
- D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials

3. Terminology

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

4. Materials and Manufacture

4.1 In the process of manufacture, a single thickness of dry felt shall be saturated with refined coal-tar from which some of the more volatile constituents have been removed.

4.2 The felt shall be produced principally from organic fibers; or mixtures thereof. 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 and particles of foreign substances.

5. Physical Requirements

5.1 The material shall conform to the physical requirements prescribed in Table 1.

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

6. Workmanship, Finish, and Appearance

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

6.2 The surface of the felt shall not be coated or covered with talc or other substances that would tend to interfere with adhesion between the felt and the plying cement.

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

7. Sampling and Test Methods

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

8. Inspection

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

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*, Vol 04.04, Standards volume information, refer to the standard's Document Summary page on the ASTM website.

TABLE 1 Physical Requirements for Coal-Tar-Saturated Organic Felt

Width of roll, in. (mm)	36 (914) ± 0.7 % ^A
Width of roll, mm (in.)	914 (36) ± 0.7 % ^A
Area of Roll	as agreed upon between the purchaser and the seller
Net mass of saturated felt, min, lb/100 ft ² (g/m ²)	13 (635)
Net mass of saturated felt, min, g/m ² (lb/100 ft ²)	635 (13)
Moisture, at point of manufacture, max % ^B	4.3
Average breaking strength, min, lbf/in. (kN/m) of width^C	
Average breaking strength, min, kN/m (lbf/in.) of width^C	
—Longitudinal (with the fiber grain)	30 (5.3)
—Longitudinal (with the fiber grain)	5.3 (30)
—Transverse (across the fiber grain)	15 (2.6)
—Transverse (across the fiber grain)	2.6 (15)
Pliability, ½ in. (13 mm) radius bend at 77°F (25°C)	no failures
Pliability, 13 mm (½ in.) radius bend at 25°C (77°F)	no failures
Mass of desaturated (unsaturated) felt, min, lb/100 ft ² (g/m ²) ^D	5.2 (254)
Mass of desaturated (unsaturated) felt, min, g/m ² (lb/100 ft ²) ^D	254 (5.2)
Mass of saturant (coal-tar), min, lb/100 ft ² (g/m ²) ^E	7.3 (356)
Mass of saturant (coal-tar), min, g/m ² (lb/100 ft ²) ^E	356 (7.3)

^A Other widths may be agreed upon between the purchaser and the seller.

^B 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.

^C If specimens fail to conform to the requirements for breaking strength after conditioning for 2 h, a retest shall be made on specimens conditioned for 72 h. The material shall be accepted or rejected on the basis of the retest.

^D The moisture-free felt shall meet this requirement prior to saturation. Coal-tar-saturated felt cannot be thoroughly desaturated by any known means; only an approximate value may be obtained through desaturation.

^E The mass of the saturant shall be not less than 1.4 times the mass of the desaturated (unsaturated) dry felt.

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

9. Rejection and Resubmittal

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

9.2 *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.

10. Packaging and Package Marking

10.1 Unless otherwise agreed upon between the supplier and purchaser, each 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.

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

10.3 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.

11. Keywords

11.1 built-up roofs; coal tar saturated; membrane; organic felt; waterproofing

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