Designation: D4990 – 97a (Reapproved 2013)

Standard Specification for Coal Tar Glass Felt Used in Roofing and Waterproofing[1]

1. Scope

1.1 This specification covers glass felt impregnated with coal tar intended to be used with coal tar pitch conforming to the appropriate requirements of Specification D450 in construction of built-up roofs and in the construction waterproofing systems.

1.2 The values stated in SI 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 methods 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:*[2]

D146 Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing

D450 Specification for Coal-Tar Pitch Used in Roofing, Dampproofing, and Waterproofing

D1079 Terminology Relating to Roofing and Waterproofing

3. Terminology

3.1 *Definitions*—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 coal tar 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 Coal tar impregnated glass felt covered by this specification is of one type.

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 coal-tar which shall be permitted to contain a mineral stabilizer so that the individual glass fibers are coated and the coal tar is evenly distributed throughout.

5.3 The impregnated glass felt shall be surfaced lightly with a suitable finely comminuted 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 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).

6.3 After extraction of the coal-tar 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) 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, 14.1 in section on Pliability.

7. Workmanship, Finish, and Appearance

7.1 The finished material shall be uniformly impregnated with coal tar of uniform thickness, and shall be free of visible defects such as ragged or untrue edges, breaks, cracks, tears and protuberances. It shall contain closely spaced pinholes not over 0.8 mm (1/32 in.) in diameter over the entire area of the felt. Individual holes up to 6.3 mm (¼ in.) in diameter shall be permitted, provided that no more than five such holes are found in any 1 m^2 (1 yd^2) of felt.

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 coal tar impregnated glass felt.

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[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.

Current edition approved May 15, 2013. Published May 2013. Originally approved in 1989. Last previous edition approved in 2005 as D4990 – 97a (2005)$^{\varepsilon 1}$. DOI: 10.1520/D4990-97AR13.

[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.

TABLE 1 Physical Properties of Coal Tar Glass Felt

Breaking Strength,[A] min, kN/M (lbf/in.)	Type 1
Longitudinal (with the fiber grain)	7.7 (44)
Transverse (across the fiber grain)	7.7 (44)
Pliability 13-mm (½-in.) radius bend	no failures

[A] To prevent the coal tar–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.

TABLE 2 Dimensions and Masses of Coal Tar Glass Felt

	Type 1
Width of roll, mm (in.), or as agreed between purchaser and supplier	914 (36) ± 0.7 %
Area of roll, m^2 (ft^2), min, or as agreed between purchaser and supplier	50.17 (540)
Net dry mass of coal tar coated glass felt, g/m^2 ($lb/100\ ft^2$), min	
Average of all rolls	342 (7.0)
Individual rolls	293 (6.0)
Parting agent and stabilizer, g/m^2 ($lb/100\ ft^2$), max	146 (3.0)
Moisture at point of manufacture, max, %[A]	1.0
Mass of desaturated glass felt, g/m^2 ($lb/100\ ft^2$), min	83 (1.7)
Bituminous saturant (coal tar), g/m^2 ($lb/100\ ft^2$), min	146 (3.0)
Ash, %	70 to 88

[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.

8.2 *Net Dry Mass of Coal Tar Coated Glass Felts*—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 a constant weight in a laboratory atmosphere of 23 ± 2°C (73.4 ± 3.6°F). 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 ± 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, 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 built-up roofs; coal tar; glass felt; waterproofing