



Designation: D 2823 – 90 (Reapproved 1997)^{e1}

Standard Specification for Asphalt Roof Coatings¹

This standard is issued under the fixed designation D 2823; 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.

^{e1} NOTE—Added Section 13 and deleted Footnote 7 editorially in April 1997.

1. Scope

1.1 This specification covers asphalt roof coatings of brushing or spraying consistency.

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 4 Test Method for Bitumen Content²
- D 95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation³
- D 140 Practice for Sampling Bituminous Materials⁴
- D 224 Specification for Smooth-Surfaced Asphalt Roll Roofing (Organic Felt)²
- D 312 Specification for Asphalt Used in Roofing²
- D 449 Specification for Asphalt Used in Dampproofing and Waterproofing²
- D 562 Test Method for Consistency of Paints Using the Stormer Viscometer⁵
- D 946 Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction⁵
- D 1079 Terminology Relating to Roofing, Waterproofing and Bituminous Materials²
- E 1 Specification for ASTM Thermometers⁶

3. Terminology

3.1 For definitions of terms used in this specification, see Terminology D 1079.

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 D08.05 on Solvent-Bearing Bituminous Compounds for Roofing and Waterproofing.

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² Annual Book of ASTM Standards, Vol 04.04.

³ Annual Book of ASTM Standards, Vol 05.01.

⁴ Annual Book of ASTM Standards, Vol 04.03.

⁵ Annual Book of ASTM Standards, Vol 06.01.

⁶ Annual Book of ASTM Standards, Vol 14.03.

4. Classification

4.1 *Type I* is made from asphalts characterized as self-healing, adhesive, and ductile, and conforming to the requirements of Specification D 312, Type I; Specification D 449, Types I or II; or Specification D 946.

4.2 *Type II* is made from asphalts characterized by high softening point and relatively low ductility, and conforming to the requirements of Specification D 312 Types II or III; or Specification D 449, Type III.

5. Materials and Manufacture

5.1 Asphalt roof coatings shall consist of an asphalt base, volatile petroleum solvents, and mineral stabilizers including asbestos fiber, mixed to a smooth, uniform consistency suitable for application by squeegee, three-knot brush, paint brush, roller, or by spraying.

6. Composition

6.1 Asphalt roof coatings complying with this specification shall conform to the following composition limits:

	min	max
Water, %	...	1.0
Nonvolatile matter, %	50	...
Asbestos and other mineral stabilizers, %	5	20
Asphalt, %	40	...
Mineral matter based on original mass of insoluble residue, %	80	...

7. Physical Requirements

7.1 *Uniformity*—After a thoroughly stirred sample has stood for 72 h at room temperature in a closed container, it shall show no separation of solvent or settling that cannot be overcome by moderate stirring.

7.2 *Consistency*—The roof coating shall be of a consistency that will spread readily and permit application by squeegee, brush, roller, or spray at the rate of 50 ft²/gal (1.25 m²/L) on prepared roofing, saturated felt, and metal surfaces at ambient temperatures above 50°F (10°C). Consistency at 77°F (25°C) shall be between 50 and 400 Stormer s/100 revolutions.

7.3 *Behavior at 140°F (60°C)*—The roof coating shall show no evidence of blistering, and sag or slide shall be no greater than ¼ in. (6 mm). Staining or absorption of the coating on the

reverse side of the prepared roofing test panel shall not exceed 5 % of the coated area.

7.4 *Pliability at 32°F (0°C)*—There shall be no cracking or separation of the roof coating from the metal.

8. Sampling

8.1 Sample the material from the original containers immediately after stirring to a uniform consistency in accordance with Practice D 140. Restir samples to ensure uniformity immediately before withdrawing portions for individual tests.

9. Test Methods

9.1 *Water*—Test Method D 95.

9.2 *Nonvolatile Matter*—Weigh 10 ± 1 g of coating to the nearest 0.01 g into each of two tared, flat-bottom dishes having a diameter of approximately 2.5 in. (64 mm) and walls $\frac{5}{8}$ in. (16 mm) high. Heat the dish and contents in an oven at 320 to 330°F (160 to 166°C) until the residue shows a loss of not more than 0.05 g on successively hourly weighings; make each weighing after cooling in a desiccator. Calculate the % nonvolatile matter from the mass of the residue and the mass of the original sample as follows:

$$\text{Nonvolatile matter, \%} = (R_e/S) \times 100 \tag{1}$$

where

R_e = mass of residue from evaporation, g, and
 S = mass of original sample, g.

Record the average of the two separate determinations.

9.3 *Asbestos and Other Mineral Stabilizers, and Asphalt*—Test Method D 4, Procedure No. 2, but substitute trichloroethylene for carbon disulfide. Mineral matter shall be reported as asbestos and other mineral stabilizers, bitumen as asphalt. Calculate asphalt as percent of original, X_a , as follows:

$$X_a = N - (100 B/A) \tag{2}$$

where:

N = percent nonvolatile matter from 8.2,
 B = net mass of insoluble residue, including corrections, and
 A = mass of sample taken.

9.4 *Mineral Matter Based on Original Mass of Insoluble Residue*—Using the data obtained in accordance with Test Method D 4, Procedure No. 2, calculate the percent mineral matter based on the original mass of the insoluble residue, M_i , as follows.

$$M_i = (C/B) \times 100 \tag{3}$$

where:

C = net mass of ignited, reconstituted mineral matter, including any corrections and
 B = net mass of insoluble residue, including any corrections.

9.5 Consistency:

9.5.1 *Summary of Test Method*—Consistency is determined using the Stormer Viscometer and the rate of shear reported in terms of the time required for 100 revolutions of the rotor produced by a specified load (compare with Test Method D 562).

9.5.2 Apparatus:

9.5.2.1 *Standard Stormer Viscometer.*

9.5.2.2 *Water Bath—Test Cup Assembly*, without central baffle or thermometer holder.

9.5.2.3 *Rotor*, propeller-type (see Fig. 1).

9.5.2.4 *Slotted Weights and a Suitable Hanger.*

9.5.2.5 *Thermometer*—ASTM Stormer Viscosity Thermometer having a range from 20 to 70°C, and conforming to the requirements for Thermometer 49C as prescribed in Specification E 1.

9.5.2.6 *Stop Watch.*

9.5.3 Preparation of Apparatus:

9.5.3.1 Place the Stormer Viscometer on a table or shelf high enough to permit the weight to drop about 40 in. (1 m), or sufficient distance to produce about 125 revolutions of the rotor. Insert the shaft of the propellar-type rotor in the chuck as far as it will go and secure it with the set screw.

9.5.3.2 Raise the water bath–test cup assembly until the bottom of the test cup just touches the bottom of the rotor blade; then lower the assembly $\frac{1}{4}$ in. (6 mm). Tighten the set screw on the position collar, if available, while the collar is in contact with the bracket and the assembly, and use this setting to position the cup for all test runs. Using the set screws in the rim of the bath holder, adjust the water bath–test cup assembly so that the cup and rotor are visually concentric.

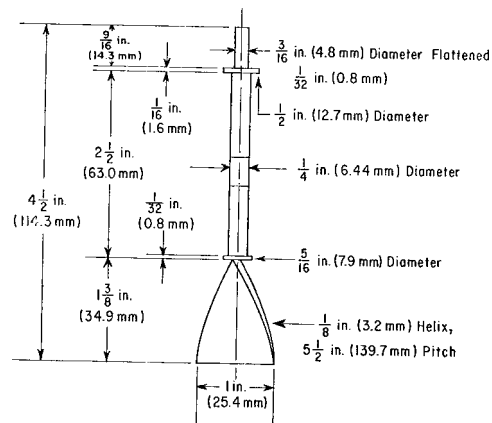
9.5.3.3 For convenience in weight adjustment, attach a slotted metal can cover approximately 2 in. (50 mm) in diameter to the hanger to support the slotted weights required.

9.5.4 Calibration:

9.5.4.1 Use a 94.85 % by weight aqueous glycerin solution as a calibration standard. Determine the initial concentration of reagent grade glycerin by accurately measuring its specific gravity (refer to the Appendix), and then add additional water to make up the desired total of 5.15 % by weight water.

9.5.4.2 Determine the weight on the viscometer cord (approximately 100 g) required to produce 100 revolutions of the rotor in the glycerin calibration standard at $25 \pm 0.2^\circ\text{C}$ in 18.0 ± 0.2 s. Check the calibration periodically, particularly after prolonged use of the instrument, and recalibrate as necessary.

9.5.5 Procedure:



NOTE 1—All dimensions are subject to a tolerance of ± 0.004 in. (± 0.1 mm). Material: nickel-plated brass or stainless steel.

FIG. 1 Propeller-Type Rotor for Use with Stormer Viscometer