Designation: D 2824 – 94

Standard Specification for Aluminum-Pigmented Asphalt Roof Coatings, Non-Fibered, Asbestos Fibered, and Fibered without Asbestos[1]

This standard is issued under the fixed designation D 2824; 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-based, aluminum roof coatings suitable for application to roofing or masonry surfaces by brush or spray.

1.2 The values stated in inch-pound units are to be regarded as the standard.

1.3 The following precautionary 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 4 Test Method for Bitumen Content[2]

D 95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation[3]

D 140 Practice for Sampling Bituminous Materials[4]

D 562 Test Method for Consistency of Paints Using the Stormer Viscometer[5]

D 962 Specification for Aluminum Powder and Paste Pigments for Paints[6]

D 2823 Specification for Asphalt Roof Coatings[2]

D 3279 Test Method for *n*-Heptane Insolubles[4]

E 200 Practice for Preparation, Standardization, and Storage of Standard Solutions for Chemical Analysis[7]

3. Classification

3.1 *Type I*—Nonfibered, containing no fiber.

3.2 *Type II*—Fibered, containing asbestos fiber.

3.3 *Type III*—Fibered, containing no asbestos fiber.

4. Materials and Manufacture

4.1 Asphalt-based, aluminum roof coatings shall consist of an asphalt base, volatile petroleum solvents, and a leafing-type of aluminum pigment conforming to the requirements of Specification D 962, with or without fiber added. They shall be mixed to a smooth, uniform consistency suitable for application by brush, roller, or by spraying.

5. Composition

5.1 Asphalt-based, aluminum roof coatings complying with this specification shall conform to the following composition limits:

	Type I	Type II or Type III
Water, max, %	0.3	0.3
Nonvolatile matter (NVM), min, %	40	40
Insoluble in CS_2, max, % of NVM	40	50
Metallic aluminum, min, %	11	9

6. Physical Requirements

6.1 *Uniformity*—After a thoroughly stirred sample has stood for 72 h at room temperature 73.4 ±° F (23 ± 2°C) in a closed container, it shall show no separation of solvent or settling that can not be overcome by moderate stirring.

6.2 *Consistency*—The roof coating shall be of a consistency that will spread readily and permit application by brush, roller, or spray to produce a film in which the aluminum pigment leafs to form a bright reflective surface on prepared roofing, saturated felt, and metal surfaces at ambient temperatures above 50°F (10°C).

6.2.1 *Type I*—Consistency at 77°F (25°C) shall be between 20 and 30 Stormer s/100 revolutions of the paddle-type rotor with a 100-g load in addition to the standardizing load.

6.2.2 *Type II*—Consistency at 77°F (25°C) shall be between 15 and 90 Stormer s/100 revolutions of the propeller-type rotor (Fig. 1) with a 300-g load in addition to the standardizing load.

6.3 *Reflectance*—The percent luminous reflectance of coatings, determined on samples before and after high temperature shelf aging, shall be not less than 50 %.

[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.

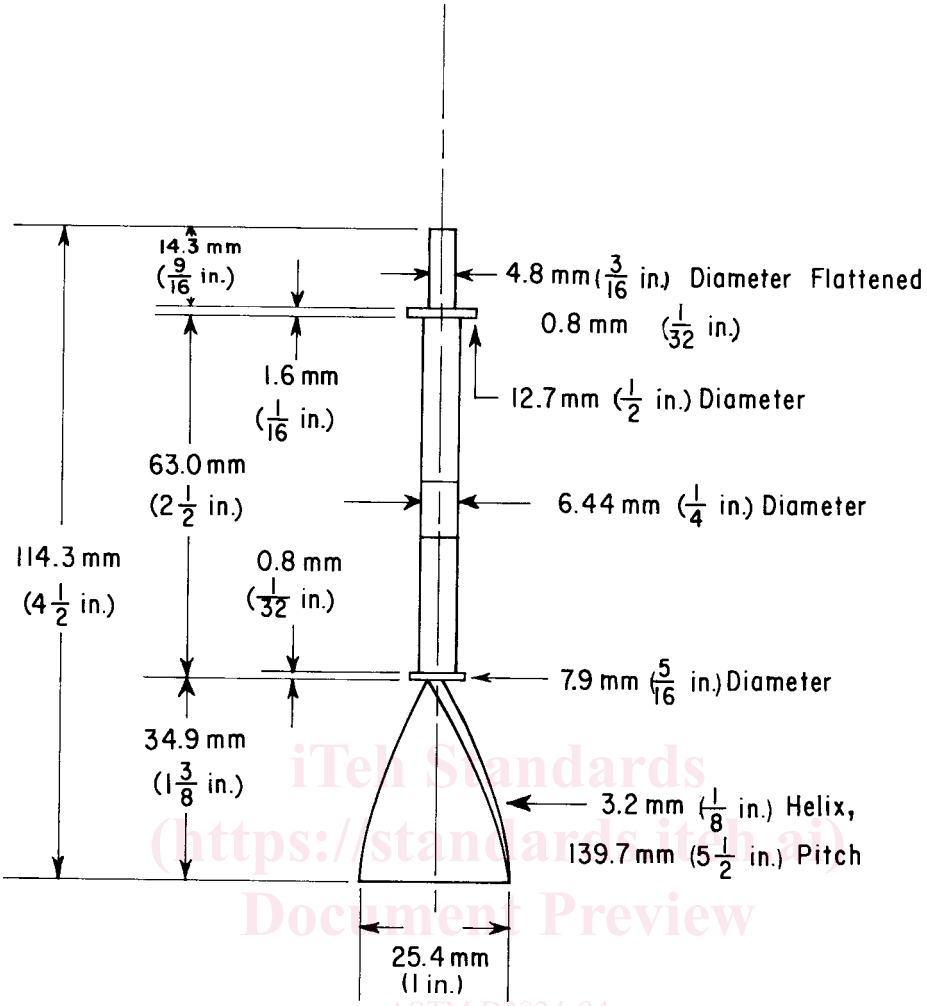
[3] *Annual Book of ASTM Standards*, Vol 05.01.

[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 06.03.

[7] *Annual Book of ASTM Standards*, Vol 15.05.



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

FIG. 1 Propeller Rotor for Use with Stormer Viscometer[9]

7. Sampling

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

8. Test Methods

8.1 *Water*—Test Method D 95.

8.2 *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 ⅝ 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 successive hourly weighings. Make each weighing after cooling in a desiccator. Calculate the percent nonvolatile matter from the mass of the residue and the mass of the original sample as follows:

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

where:

R_e = mass of residue from evaporation, g, and

S = mass of original sample, g.

Record the average of the two separate determinations.

8.3 *Insoluble in CS_2*—Test Method D 4. Trichloroethylene may be used in place of carbon disulfide, if desired.

8.4 *Metallic Aluminum*:

8.4.1 *Reagents*—Reagent grade chemicals or equivalent, prepared in conformance with Practice E 200, shall be used in the determination of metallic aluminum.

8.4.1.1 *Water*—Use only distilled or deionized water.

8.4.1.2 *Ferric Sulfate Solution*—Dissolve 330 g of ferric sulfate [$Fe_2(SO_4)_3 \cdot 9H_2O$] in 750 cm^3 of water and 75 cm^3 of concentrated sulfuric acid (sp gr 1.84). Heat the solution and let stand 2 days to dissolve the ferric sulfate completely. Then add water to make up a total volume of 1000 cm^3.

8.4.1.3 *Indicator (Diphenylamine Sulfonate Solution)*[8]—Dissolve 0.32 g of the barium salt of diphenylamine sulfonic acid in 100 cm^3 of water. Then add 0.5 g of sodium sulfate and filter off the precipitate of barium sulfate.

[8] Diphenylamine sulfonate can be purchased from Sargent and Co., Distillation Products Industries, Division of Eastman Kodak Co., and possibly other firms.