Designation: D6511/D6511M – 18 (Reapproved 2024)

Standard Test Methods for Solvent Bearing Bituminous Compounds[1]

This standard is issued under the fixed designation D6511/D6511M; 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.

1. Scope

1.1 These test methods cover procedures for sampling and testing solvent bearing bituminous compounds for use in roofing and waterproofing.

1.2 The test methods appear in the following order:

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials

D4 Test Method for Bitumen Content

D88/D88M Test Method for Saybolt Viscosity

D95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation

D140/D140M Practice for Sampling Asphalt Materials

D146/D146M Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing

D224 Specification for Smooth-Surfaced Asphalt Roll Roofing (Organic Felt) (Withdrawn 2002)[3]

D249 Specification for Asphalt Roll Roofing (Organic Felt) Surfaced with Mineral Granules (Withdrawn 2002)[3]

D562 Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer

D1475 Test Method for Density of Liquid Coatings, Inks, and Related Products

D2369 Test Method for Volatile Content of Coatings

D2824/D2824M Specification for Aluminum-Pigmented Asphalt Roof Coatings, Nonfibered, and Fibered without Asbestos

D4017 Test Method for Water in Paints and Paint Materials by Karl Fischer Method

E1 Specification for ASTM Liquid-in-Glass Thermometers

E145 Specification for Gravity-Convection and Forced-Ventilation Ovens

E200 Practice for Preparation, Standardization, and Storage of Standard and Reagent Solutions for Chemical Analysis

3. Significance and Use

3.1 These tests are useful in sampling and testing solvent bearing bituminous compounds to establish uniformity of shipments.

[1] These test methods are under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and are the direct responsibility of Subcommittee D08.05 on Solvent-Bearing Bituminous Compounds for Roofing and Waterproofing.

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[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.

[3] The last approved version of this historical standard is referenced on www.astm.org.

4. Sampling

4.1 Determine the number of containers sampled to represent a shipment in accordance with Practice D140/D140M.

4.2 Open the original containers and examine them for uniformity of contents. Record the degree of separation, if any, into portions of appreciably different consistency, such as thick or thin layers, sedimentation or coagulation, etc. Also, note any difficulty encountered in stirring to a uniform condition.

4.3 Take the samples for laboratory examination from the original containers immediately after stirring to a uniform condition. Restir individual or combined samples immediately before taking out portions for tests.

5. Uniformity

5.1 *Procedure*—Examine the contents of a full container of not less than 1 L or 1 qt in volume that has stood undisturbed for 72 h.

5.2 *Report*—Make a notation of any separation or settlement of suspended matter that cannot be overcome by moderate agitation.

6. Weight per Gallon / Specific Gravity

6.1 *Apparatus:*

6.1.1 *Weight-per-Gallon Cup,* with lid, stainless steel, calibrated to contain 83.3 g of water at 25 ± 0.5 °C [77 ± 1 °F].

6.1.2 *Balance,* accurate to 0.01 g.

6.1.3 *Water Bath,* constant temperature, maintained at 25 ± 0.5 °C [77 ± 1 °F].

6.2 *Procedure:*

6.2.1 Stir the sample and place in the 25 °C [77 °F] water bath until the sample temperature reaches 25 ± 0.5 °C [77 ± 1 °F]. Time required for temperature equilibration depends on sample size and configuration.

6.2.2 Condition cup and lid to 25 ± 0.5 °C [77 ± 1 °F]. Weigh the weight-per-gallon cup with lid to the nearest 0.01 g and record as tare weight.

6.2.3 Remove the sample from the bath and stir until homogeneous. Avoid trapping air in the sample during stirring.

6.2.4 Carefully fill the weight-per-gallon cup with the sample, avoiding the entrapment of air. Jar or vibrate the cup until no further change in volume occurs.

6.2.5 Immediately place the lid on the weight-per-gallon cup and remove, with a clean rag or paper, the excess sample oozing through the orifice in the lid.

6.2.6 When the lid is placed on tightly, clean the weight-per-gallon cup carefully, weigh on the balance to the nearest 0.01 g, and record as weight of sample and tare.

6.3 *Calculations:*

6.3.1 Calculate the weight per gallon of the sample as follows:

$$D = (B - A)/10 \quad (1)$$

where:

A = tare weight of weight-per-gallon cup, g,
B = weight of sample and tare g, and
D = weight per gallon of sample, lb/gal. To convert units to kg/m^3, multiply D by 119.83.

6.3.2 Calculate the specific gravity of the sample as follows:

$$SG = D/8.33 \quad (2)$$

where:

SG = specific gravity,
D = weight per gallon of sample calculation from 6.3.1, and
8.33 = weight per gallon of water at 25 ± 0.5 °C [77 ± 1 °F].

6.4 *Report:*

6.4.1 Report the weight per gallon of the sample in pounds per gallon to the nearest 0.1 lb at 25 °C [77 °F].

6.4.2 Report the specific gravity of the sample to the nearest hundredth at 25 °C [77 °F].

7. Nonvolatile Content

7.1 *Apparatus:*

7.1.1 *Metal Dish,* flat bottom, having a diameter of 65 mm [2.5 in.] with walls 10 mm [⅝ in.] high.

7.1.2 *Oven,* forced draft, conforming to Specification E145, Type III B for asphalt products, or a standard convection oven for coal tar products.

7.1.3 *Balance,* capable of weighing 50 g to within ±0.01 g.

7.2 *Procedure*—Weigh 10 ± 1.00 g in the tared metal dish to the nearest 0.01 g. Dry the dish and its contents in a forced draft oven at 163 ± 3 °C [325 ± 5 °F] for asphalt products, or 105 to 110 °C [221 to 230 °F] in standard convection oven for coal tar products, until the residue shows a loss of not more than 0.05 g on successive hourly weighings (approximately 4 h) after cooling in a desiccator.

7.3 *Calculation*—Calculate the percent nonvolatile content, R_I, from the mass of the dry residue and the mass of the original sample, as follows:

$$R_I = (R/S) \times 100 \quad (3)$$

where:

R = mass of dry residue, g, and
S = mass of sample, g.

7.4 *Report*—Record the average of two determinations.

8. Solubility of Residue in Carbon Disulfide or Trichloroethylene

8.1 *Apparatus*—See Test Method D4.

8.2 *Procedure*—Determine the matter soluble in carbon disulfide or trichloroethylene on a representative portion of the nonvolatiles (Section 7), in accordance with Test Method D4.

8.3 *Calculation*—Calculate the percent solubility in carbon disulfide or trichloroethylene S_I from the mass of the residue and the mass of the original sample as follows:

$$S_I = (R/S) \times 100 \quad (4)$$

where:

R = mass of insoluble residue, g, and
S = mass of sample, g.