Designation: D2832 – 92 (Reapproved 2016)

Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings[1]

This standard is issued under the fixed designation D2832; 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 This guide is intended to aid in the selection of the proper ASTM standard for determining the volatile and nonvolatile content of paint and related coatings.

NOTE 1—Test methods for determining the composition of the volatile fraction are not covered by this guide.

1.2 The standards included are as follows:

Type of Coating	Section	ASTM Designation
Aerosol coatings	4.1	D3062
Architectural wall coatings, interior, high performance	4.3	D1644
Asphalt roof coatings	4.4	D2823
Asphalt roof coatings, aluminum-pigmented	4.5	D2824
Bitumens, emulsified	4.6	D2939
Bleached lac varnish	4.7	D1650
Coil coatings	4.8	D1353
		D2697
Electrical insulation varnishes	4.9	D115
House paints, gloss		D2697
Industrial baking enamel		D2697
Lacquers, clear and pigmented	4.11	D1644
		D333
Latex paint, exterior		D2697
Latex paint, interior		D2697
Magnet wire enamels	4.12	D3288
Plastics, coatings for	4.13	D1644
Powder coatings	4.14	D3451
Shellac varnish, orange	4.7	D1650
Silanes, Siloxanes and Silane-Siloxane Blends	4.18	D5095
Solvent-reducible coatings	4.2	D2369
Traffic paints	4.15	D2205
Varnishes	4.16	D1644
Wall and trim enamels, interior semigloss, solvent-based	4.17	D2697
Wall paints, flat	4.10	D2697
Water-reducible coatings	4.2	D2369

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D115 Test Methods for Testing Solvent Containing Varnishes Used for Electrical Insulation

D333 Guide for Clear and Pigmented Lacquers

D1353 Test Method for Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer, and Related Products

D1644 Test Methods for Nonvolatile Content of Varnishes

D1650 Test Methods for Sampling and Testing Shellac Varnish (Withdrawn 1997)[3]

D2205 Guide for Selection of Tests for Traffic Paints

D2369 Test Method for Volatile Content of Coatings

D2697 Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings

D2823 Specification for Asphalt Roof Coatings, Asbestos-Containing

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

D2939 Test Methods for Emulsified Bitumens Used as Protective Coatings (Withdrawn 2012)[3]

D3062 Test Method for Solids Content of Aerosol Coatings (Withdrawn 1994)[3]

D3288 Test Methods for Magnet-Wire Enamels

D3451 Guide for Testing Coating Powders and Powder Coatings

D5095 Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments

[1] This guide is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.21 on Chemical Analysis of Paints and Paint Materials.

Current edition approved April 1, 2016. Published April 2016. Originally approved in 1969. Last previous edition approved in 2011 as D2832 – 92 (2011). DOI: 10.1520/D2832-92R16.

[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.

3. Significance and Use

3.1 The nonvolatile content of paint and related coatings is useful to producers and users and to environmental and health and safety interests in comparing the coverage of competing products and in estimating the volatile organic content.

4. Procedure

4.1 *Aerosol Coatings*—Test Method D3062 covers the determination of solids content (weight %) in aerosol coatings.

4.2 *Volatile Content of Coatings (Test Method D2369)*—This test method covers the determination of the volatile content of coatings. It is considered to be applicable to most solvent-reducible and water-reducible paints.

4.3 *High Performance Interior Architectural Wall Coatings (HIPAC)*—Determine the nonvolatile content of HIPAC coatings in accordance with Test Methods D1644. Calculate the volatile content (weight %) by difference.

4.3.1 *Method A*—3 h at 105°C for paints with nonsolvent components that decompose at higher temperature.

4.3.2 *Method B*—10 min at 149°C for most paints with nonsolvent components that are reasonably stable at 149°C.

4.4 *Asphalt Roof Coatings*—Determine the nonvolatile content (weight %) of asphalt roof coatings of brushing or spraying consistency in accordance with the Physical Requirements Consistency section of Specification D2823.

4.5 *Aluminum-Pigmented Asphalt Roof Coatings*—The nonvolatile content (weight %) of asphalt-based aluminum roof coatings suitable for application to roofing or masonry surfaces by brush or spray is determined in accordance with the Physical Requirements Consistency section of Specification D2824.

4.6 *Emulsified Bitumens Used as Protective Coatings*—Section 8 of Test Methods D2939 contains a method for determining residue by evaporation (weight %) of emulsified bitumens used in relatively thick films as protective coatings for metals and built-up roofs.

4.7 *Shellac Varnish*—Determine the nonvolatile matter in orange shellac and bleached lac varnishes in accordance with Sections on Drying Time Procedure and Nonvolatile Matter Materials and Procedure sections of Methods D1650.

4.8 *Coil Coatings*—Although stated to be for solvents, determine the nonvolatile matter (weight %) in accordance with Test Method D1353. Determine volume solids in accordance with Test Method D2697.

4.9 *Electrical Insulation Varnishes:*

4.9.1 Sections on Procedure, Report, Significance and Use, Apparatus, and Procedure of Test Methods D115 on nonvolatile matter by weight, are applicable to the following classifications of varnishes used for electrical insulation: alcohol-soluble varnishes, oxidizing air-drying varnishes, thermosetting varnishes, oxidizing baking varnishes, air-drying asphaltic varnishes, silicone varnishes, and thermo-setting laminating varnishes.

4.9.2 Determine nonvolatile matter in electrical insulating varnishes intended for electrical equipment operating at 180°C and above in accordance with Test Methods D115 except that the temperature used shall be 135 ± 3°C (275 ± 5.5°F) or at a temperature agreed upon between the producer and the user.

4.10 *Volume Nonvolatile Matter in Clear or Pigmented Coatings (Test Method D2697)*—This test method is applicable to the determination of the volume nonvolatile matter of coatings. A gloss enamel, a flat wall paint, a gloss house paint, an industrial baking enamel, an interior latex paint, and an exterior latex paint included in formal collaborative studies of this test method.

4.11 *Lacquer Coatings*—Determine the nonvolatile content of clear and pigmented lacquers as described in Test Methods D1644. As an additional requirement, the specimen shall be reheated and reweighed until the weight is constant to within 1 mg. Method A of Test Methods D1644 is preferred since Method B is potentially dangerous when used with lacquers.

4.12 *Magnet Wire Enamels*—The Determined Solids and Stack Loss sections of Test Method D3288 cover the determination of nonvolatile content (weight %) in magnet wire enamels.

4.13 *Coatings for Plastics*—Determine nonvolatile matter in clear and pigmented coatings designed for use on rigid or semirigid plastic substrates in accordance with Test Methods D1644.

4.14 *Polymeric Powders and Powder Coatings*—Determine nonvolatile content (weight %) in accordance with the Accelerated Storage Stability section of Coating Powder Properties of Practices D3451. Determine volatile content at baking or fusion temperature in accordance with the Cured Weight Loss for Thermosetting Coating Powders section of Practices D3451.

4.15 *Traffic Paints*—Determine the nonvolatile content of traffic paints, ready-mixed, of spraying consistency of the premix, drop-in, or combination type in accordance with Test Methods D1644, and state any necessary larger specimen size for beaded paint. Either of the two methods can be used as follows:

4.15.1 *Method A*—3 h at 105°C for paints with nonsolvent components that decompose at higher temperature.

4.15.2 *Method B*—10 min at 149°C for most paints with nonsolvent components that are reasonably stable at 149°C.

4.16 *Varnishes*—Nonvolatile content (weight %) of varnishes is determined using Test Methods D1644. These test methods may give high results due either to incomplete elimination of volatile matter or to absorption of oxygen by oxidizing-type varnishes.

4.17 *Solvent-Based Interior Semigloss Wall and Trim Enamels*—Use Test Method D2369 to determine volatile content. Volume nonvolatile matter is determined in accordance with Test Method D2697.

4.18 *Silanes, Siloxanes and Silane-Siloxane Blends Used in Masonry Water Repellant Treatments*—Test Method D5095 describes a procedure for the determination of the nonvolatile content of silanes, siloxanes and the blended silane-siloxane

materials used in masonry water repellent treatments and is applicable to both solvent and water-borne materials.

5. Precision

5.1 Some of the referenced ASTM standards have precision limits. Reference to the individual standards for precision statements is recommended.

6. Keywords

6.1 nonvolatile content of paints and related coatings; volatile content of paints and related coatings