Designation: D4834 – 03 (Reapproved 2014)

Standard Test Method for Detection of Lead in Paint by Direct Aspiration Atomic Absorption Spectroscopy[1]

This standard is issued under the fixed designation D4834; 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 test method is intended as a screening test to determine if the solids in a paint contain more than 0.06 % lead. The test described can differentiate between 0.05 and 0.06 %. Paints giving a result greater than 0.05 % should be analyzed quantitatively for lead using Test Method D3335. This test method provides a more definitive and reliable screening test than Test Method D3618.

1.2 There is no reason to believe that higher levels of lead could not be determined by this test method provided that appropriate dilutions and adjustments in specimen size and reagent quantities are made.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1193 Specification for Reagent Water

D2832 Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings

D3335 Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy

D3618 Test Method for Detection of Lead in Paint and Dried Paint Films

3. Summary of Test Method

3.1 A weighed quantity of the paint sample is diluted (solvent-reducible paints in methyl isobutyl ketone and water-reducible paints in water) and then aspirated into the burner of an atomic absorption spectrometer. Lead content of the paint is determined from a calibration plot of absorbance versus concentration, prepared from standard coatings containing known amounts of lead.

4. Significance and Use

4.1 Current U.S. regulations restrict the amount of lead that may be present in consumer paint products to less than 0.06 % based on the total solids. This test method provides a rapid means for screening paints to determine compliance with those regulations. The test method may be adjusted to meet regulations with a different limit on lead content.

5. Apparatus

5.1 *Atomic Absorption Spectrophotometer,* consisting of an atomizer and either a single- or a three-slot burner, gas pressure regulating and metering devices for air and acetylene, lead source lamp with a regulated constant-current supply, a monochromator and associated optics, a photosensitive detector connected to an electronic amplifier, and a readout device.

5.2 *Volumetric Flasks,* 50 mL.

6. Reagent and Materials

6.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests unless otherwise specified. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.[3] Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

[1] This test method 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.

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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] *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.