



Standard Test Method for Identification and Quantification of Lead in Paint and Similar Coating Materials using Energy Dispersive X-ray Fluorescence Spectrometry (EDXRF)¹

This standard is issued under the fixed designation F3078; 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 describes an energy dispersive X-ray fluorescence (EDXRF) procedure for determining the areal mass of Pb in mass per unit area in paint and similar coatings on common substrates of toys and consumer products, such as plastic, wood, steel, aluminum, zinc alloys or fabric.

1.2 This test method is applicable for homogeneous, single layer paint or similar coatings. The method does not apply to metallic coatings.

1.3 This test method is applicable for a range of Pb mass per unit area from 0.36 µg/cm² to approximately 10 µg/cm² for Pb in paint and similar coatings applied on common substrates. The lower limit of this test method is between 0.36 and 0.75 µg/cm² depending on the nature of the substrate. Based on the results obtained during the interlaboratory study (ASTM Report F40-1004), it is estimated that the applicable range of this method can be extended up to 50 µg/cm².

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

1.5 *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

D16 Terminology for Paint, Related Coatings, Materials, and Applications

D883 Terminology Relating to Plastics

D1005 Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers

D6132 Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Coating Thickness Gage

D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance

D7091 Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals

E135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

C693 Test Method for Density of Glass by Buoyancy

F2576 Terminology Relating to Declarable Substances in Materials

2.2 Other Standards:

Consumer Products Safety Improvement Act of 2008 (CPSIA), Public Law 110-314, August 14, 2008³

SSPC-PA2 Paint Application Standard No. 2, Measurement of Dry Coating Thickness with Magnetic Gauges⁴

NIST Special Publication 829 Use of NIST Standard Reference Materials for Decisions on Performance of Analytical Chemical Methods and Laboratories⁵

3. Terminology

3.1 Definitions:

3.1.1 Definitions of terms applying to X-ray fluorescence (XRF) spectrometry, plastics and declarable substances appear

¹ This test method is under the jurisdiction of ASTM Committee F40 on Declarable Substances in Materials and is the direct responsibility of Subcommittee F40.01 on Test Methods.

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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 Full text is available on the Consumer Products Safety Commission website: <http://www.cpsc.gov/PageFiles/113865/cpsia.pdf>.

⁴ Available from Society for Protective Coatings (SSPC), 40 24th St., 6th Floor, Pittsburgh, PA 15222, <http://www.sspc.org>.

⁵ Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 1070, Gaithersburg, MD 20899-1070, <http://www.nist.gov>.