



Designation: E1583 – 21a

Standard Practice for Evaluating Laboratories Engaged in Determination of Lead in Paint, Dust, Airborne Particulates, and Soil Taken From and Around Buildings and Related Structures¹

This standard is issued under the fixed designation E1583; 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 practice covers the qualifications, including minimum requirements for personnel and equipment, duties, responsibilities, and services of laboratories engaged in the determination of lead in paint, or settled dust, or airborne particulates, or soil, or any combination thereof, taken from and around buildings and related structures.

1.2 This practice has been developed consistent with Guides E548 and E994, to supplement ISO/IEC 17025.

1.3 This practice contains notes that are explanatory and are not part of the mandatory requirements of the practice.

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

- D1356 Terminology Relating to Sampling and Analysis of Atmospheres
- D3335 Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy

¹ This practice is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.12 on Sampling and Analysis of Lead for Exposure and Risk Assessment.

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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.

- D4185 Test Method for Measurement of Metals in Workplace Atmospheres by Flame Atomic Absorption Spectrophotometry
- D6785 Test Method for Determination of Lead in Workplace Air Using Flame or Graphite Furnace Atomic Absorption Spectrometry
- D7035 Test Method for Determination of Metals and Metalloids in Airborne Particulate Matter by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)
- D7439 Test Method for Determination of Elements in Airborne Particulate Matter by Inductively Coupled Plasma–Mass Spectrometry
- E548 Guide for General Criteria Used for Evaluating Laboratory Competence (Withdrawn 2002)³
- E631 Terminology of Building Constructions
- E994 Guide for Calibration and Testing Laboratory Accreditation Systems General Requirements for Operation and Recognition (Withdrawn 2003)³
- E1187 Terminology Relating to Conformity Assessment (Withdrawn 2006)³
- E1605 Terminology Relating to Lead in Buildings
- E1613 Test Method for Determination of Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absorption Spectrometry (GFAAS) Techniques (Withdrawn 2021)³
- E1644 Practice for Hot Plate Digestion of Dust Wipe Samples for the Determination of Lead
- E1645 Practice for Preparation of Dried Paint Samples by Hotplate or Microwave Digestion for Subsequent Lead Analysis
- E1726 Practice for Preparation of Soil Samples by Hotplate Digestion for Subsequent Lead Analysis
- E1979 Practice for Ultrasonic Extraction of Paint, Dust, Soil, and Air Samples for Subsequent Determination of Lead
- E2708 Terminology for Accreditation and Certification

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

- E2913/E2913M** Practice for Hotplate Digestion of Lead from Compositing Wipe Samples
- E2914/E2914M** Practice for Ultrasonic Extraction of Lead from Compositing Wipe Samples
- E3193** Test Method for Measurement of Lead (Pb) in Dust by Wipe, Paint, and Soil by Flame Atomic Absorption Spectrophotometry (FAAS)
- E3203** Test Method for Determination of Lead in Dried Paint, Soil, and Wipe Samples by Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES)

2.2 ISO Standards:⁴

- ISO 8518** Workplace air — Determination of particulate lead and lead compounds — Flame or electrothermal atomic absorption spectrometric method
- ISO 9000** Quality management systems — Fundamentals and vocabulary
- ISO 15202-2** Workplace air — Determination of metals and metalloids in airborne particulate matter by inductively coupled plasma atomic emission spectrometry — Part 2: Sample preparation
- ISO 15202-3** Workplace air — Determination of metals and metalloids in airborne particulate matter by inductively coupled plasma atomic emission spectrometry — Part 3: Analysis
- ISO/IEC 17011** Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies
- ISO/IEC 17025** General requirements for the competence of testing and calibration laboratories
- ISO 30011** Workplace air — Determination of metals and metalloids in airborne particulate matter by inductively coupled plasma mass spectrometry

2.3 EPA Documents:

- EPA SW-846** Test Methods for Evaluating Solid Waste: Physical/Chemical Methods⁵
- EPA 600/R-93/200** Standard Operating Procedure for the Field Analysis of Lead in Paint, Bulk Dust, and Soil by Ultrasonic, Acid Digestion and Colorimetric Measurement

2.4 Other Documents:

- NIOSH** Manual of Analytical Methods (NMAM), 5th Edition⁶
- AOAC** Official Methods of Analysis of AOAC International, 19th Edition (2012)⁷

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology **D1356**, or Terminology **E631**, or

Terminology **E1187**, or Terminology **E1605**, or Terminology **E2708**.

3.1.1 *accreditation body*—authoritative body that performs accreditation. **(ISO/IEC 17011)**

3.1.1.1 *Discussion*—For example, an accreditation body may be an organization that has demonstrated competency to ISO/IEC 17011 and successfully completed the peer evaluation process through the International Laboratory Accreditation Cooperation (ILAC) recognition process or through an ILAC regional cooperation such as the Inter-American Accreditation Cooperation (IACC) or Asia Pacific Laboratory Accreditation Cooperation (APLAC), or both.

3.1.2 *management system*—set of interrelated or interacting elements of an organization to establish policies and objectives, and processes to achieve those objectives. **(ISO 9000)**

4. Significance and Use

4.1 This practice provides the basic criteria to be used by accreditation bodies and others in evaluating the qualifications of laboratories engaged in the testing of lead in paint, or settled dust, or airborne particulates, or soil, or combination thereof, taken from and around buildings and related structures. The criteria in this practice shall be supplemented by additional specific criteria and requirements, when appropriate; for example, when necessary to be in accordance with federal, state, or local government regulations.

4.2 The accreditation is for organizations and not individuals.

4.3 The practice is intended to provide objective information on the capabilities needed by laboratories to determine lead in paint, dust, airborne particulates, and soil taken from and around buildings and related structures. It is not intended to be used to compare one laboratory with another.

4.4 This practice is also intended for use by laboratories in the development and implementation of their management systems and for use to request or perform an evaluation of in-house facilities in accordance with this practice.

5. Organization

5.1 The laboratory shall be legally identifiable. The laboratory shall be organized and shall operate in such a way that its facilities meet the requirements of this practice.

5.2 The laboratory shall meet the following requirements:

5.2.1 Have an organizational structure, including a quality assurance program within its management system, that enables it to maintain the capability to satisfactorily perform tests for the determination of lead in paint, dust, airborne particulates, and soil taken from and around buildings and related structures;

5.2.2 Be able to demonstrate, on request from the persons or organizations evaluating the laboratory's competence, that the laboratory is capable of performing the tests for which the laboratory is being evaluated;

5.2.3 Be organized so that staff members are not subject to undue pressure or inducement that might influence their judgment or the results of their work;

⁴ Available from International Organization for Standardization (ISO), ISO Central Secretariat, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <https://www.iso.org>.

⁵ Available from United States Environmental Protection Agency (EPA) / Office of Resource Conservation and Recovery, 1200 Pennsylvania Ave., NW (5305P), Washington DC 20460, <https://www.epa.gov/hw-sw846>.

⁶ Available from National Institute for Occupational Safety and Health (NIOSH), Patriots Plaza 1, 395 E Street, SW, Suite 9200, Washington, DC 20201, <https://www.cdc.gov/niosh/nmam>.

⁷ Available from AOAC International, 2275 Research Blvd., Suite 300, Rockville, MD 20850-3250, <http://www.aoac.org>.