



Designation: E1728/E1728M – 20

Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination¹

This standard is issued under the fixed designation E1728/E1728M; 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 collection of settled lead-containing dust on surfaces using the wipe sampling method. These samples are collected in a manner that will permit subsequent extraction (see Practices E1644 and E1979) and determination of lead using laboratory analysis techniques such as atomic spectrometry (see Test Methods E3193/E3193M and E3203) or electroanalysis (see Practice E2051). For collection of settled dust samples for determination of lead and other metals, use Practice D6966.

1.2 This practice does not address the sampling design criteria (that is, sampling plan which includes the number and location of samples) that are used for clearance (see Practices E2271/E2271M and E3074/E3074M), lead hazard evaluation, or risk assessment (see Guide E2115), and other purposes. To provide for valid conclusions, sufficient numbers of samples should be obtained as directed by a sampling plan.

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

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

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

1.6 *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

D4840 Guide for Sample Chain-of-Custody Procedures

D6966 Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Determination of Metals

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

E1644 Practice for Hot Plate Digestion of Dust Wipe Samples for the Determination of Lead

E1792 Specification for Wipe Sampling Materials for Lead in Surface Dust

E1979 Practice for Ultrasonic Extraction of Paint, Dust, Soil, and Air Samples for Subsequent Determination of Lead

E2051 Practice for the Determination of Lead in Paint, Settled Dust, Soil and Air Particulate by Field-Portable Electroanalysis (Withdrawn 2010)³

E2115 Guide for Conducting Lead Hazard Assessments of Dwellings and of Other Child-Occupied Facilities

E2271/E2271M Practice for Clearance Examinations Following Lead Hazard Reduction Activities in Multifamily Dwellings

E2239 Practice for Record Keeping and Record Preservation for Lead Hazard Activities

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.

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

E3074/E3074M Practice for Clearance Examinations Following Lead Hazard Reduction Activities in Single Family Dwellings, in Individual Units of Multifamily Dwellings, and in Other Child-Occupied Facilities

E3193/E3193M 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 *U.S. Environmental Protection Agency Regulations*.⁴

40 CFR 745.63 U.S. Environmental Protection Agency Federal Register, Vol 66, No. 4, 5 Jan. 2001, p. 1206

2.3 *U.S. Department of Housing and Urban Development Guidance*.⁵

HUD Guidelines Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

2.4 *International Standards:*

ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories⁶

3. Terminology

3.1 For definitions of terms not listed here, see Terminologies **D1356** or **E1605**.

3.2 *Definitions:*

3.2.1 *batch, n*—a group of field or quality control (QC) samples that are collected or processed together at the same time using the same reagents and equipment.

3.2.2 *sampling location, n*—a specific area within a sampling site that is subjected to sample collection.

3.2.2.1 *Discussion*—Multiple sampling locations are commonly designated for a single sampling site.

3.2.3 *sampling site, n*—a local geographic area that contains the sampling locations.

3.2.3.1 *Discussion*—A sampling site is generally limited to an area that is easily covered by walking.

3.2.4 *wipe, n*—a disposable towellette that is moistened with a wetting agent. **E1792**

3.2.4.1 *Discussion*—These towellettes are used to collect a sample of settled dust on a surface for subsequent lead analysis.

3.3 *Definitions of Terms Specific to This Standard:*

3.3.1 *field blank, n*—a wipe that is exposed to the same handling as field samples except that no sample is collected (no surface is actually wiped).

3.3.1.1 *Discussion*—Analysis results from field blanks provide information on the analyte background level in the wipe combined with the potential contamination experienced by samples collected within the batch resulting from handling.

⁴ Available from United States Environmental Protection Agency (EPA), William Jefferson Clinton Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, <http://www.epa.gov>.

⁵ Available from U.S. Department of Housing and Urban Development, 451 7th Street S.W., Washington, DC 20410, <https://www.hud.gov>.

⁶ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

4. Summary of Practice

4.1 Wipe samples of settled dust are collected on surfaces from areas of known dimensions with wipes meeting Specification **E1792**, using a specified pattern of wiping.

4.2 The collected wipes are then ready for subsequent sample preparation and analysis by procedures such as Practice **E1644**, Practice **E1979**, Practice **E2051**, Test Method **E1613**, Practice **E3074/E3074M**, and Test Method **E3203**.

5. Significance and Use

5.1 This practice is intended for the collection of settled dust samples in and around buildings and related structures for the subsequent determination of lead content in a manner consistent with that described in the HUD Guidelines and 40 CFR 745.63. The practice is meant for use in the collection of settled dust samples that are of interest in clearance, hazard assessment, risk assessment, and other purposes.

5.2 Use of different pressures applied to the sampled surface along with the use of different wiping patterns contribute to collection variability. Thus, the sampling result can vary between operators performing collection from identical surfaces as a result of collection variables. Collection for any group of sampling locations at a given sampling site is best when limited to a single operator.

5.3 This practice is recommended for the collection of settled dust samples from hard, relatively smooth, nonporous surfaces. This practice is less effective for collecting settled dust samples from surfaces with substantial texture such as rough concrete, brickwork, textured ceilings, and soft fibrous surfaces such as upholstery and carpeting.

6. Apparatus and Materials

6.1 *Sampling Templates*—One or more of the following: A 10 by 10 cm [12 by 12 in.] reusable aluminum or plastic, or disposable cardboard or plastic template, (full-square, rectangular, square “U-shaped,” rectangular “U-shaped,” and “L-shaped”) or templates of alternative areas having accurately known dimensions.

NOTE 1—For most surfaces, it is recommended to collect settled dust from a minimum of a 100 cm² [1 ft²] area to provide sufficient material for laboratory analysis.⁷ However, areas larger than 100 cm² [1 ft²] may be appropriate for surfaces having little or no visible settled dust, and a smaller sampling area may be appropriate for surfaces with very high levels of visible settled dust.

NOTE 2—Templates should be capable of lying flat on a surface.

6.2 *Wipes*, meeting Specification **E1792**.

6.3 *Sample containers*, resealable, rigid-walled, 50-mL minimum volume.

NOTE 3—Screw-top plastic centrifuge tubes or plastic bottles are examples of suitable rigid-walled sample containers.

NOTE 4—Use of a resealable plastic bag for holding and transporting the settled dust wipe sample is not recommended due to the potential losses of settled dust within the plastic bag during transportation and

⁷ Sussell, A., Hart, C., Wild, D. and Ashley, K., “An Evaluation of Worker Lead Exposures and Cleaning Effectiveness During Removal of Deteriorated Lead-Based Paint,” *Applied Occupational and Environmental Hygiene*, Vol 14, 1999, pp. 177–185.