



Designation: **E1605–18a** **E1605 – 18b**

Standard Terminology Relating to Lead in Buildings¹

This standard is issued under the fixed designation E1605; 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 terminology standard covers definitions for the following:

1.1.1 Terms that are commonly used in the field of management of lead hazards in facilities;

1.1.2 Architectural terms, particularly those associated with older wood-frame buildings; and,

1.1.3 Specialized terms that may be encountered by users in reports and notices that are generated during lead hazard management activities.

1.2 This terminology standard is supplementary to Terminology **E631**.

1.3 Definitions adopted or derived from other documents include the following:

1.3.1 Some of the definitions in this terminology standard are adopted as exact copies from other sources. The source is briefly identified at the right margin following the definition and fully identified in Section 2.

1.3.2 Some of the definitions in this terminology standard are adapted from other sources. Changes in these definitions were made only to clarify the meaning, to incorporate related terms that also are defined in this terminology standard, or to ensure that the revised definition is consistent with those for related terms. The source is briefly identified with the words “adapted” at the right margin following the definition, and is fully identified in Section 2.

1.4 Terms within the definitions that are shown in boldface are defined in this terminology standard.

1.5 This terminology standard excludes the following:

1.5.1 Terms with a common dictionary meaning, except in cases where there is a specialized definition within the field of lead hazard management.

1.5.2 Terms that are used only in individual ASTM standards in which they are defined adequately, whether formally or by the context in which they appear.

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

C186 Test Method for Heat of Hydration of Hydraulic Cement

C859 Terminology Relating to Nuclear Materials

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

D123 Terminology Relating to Textiles

D661 Test Method for Evaluating Degree of Cracking of Exterior Paints

D772 Test Method for Evaluating Degree of Flaking (Scaling) of Exterior Paints

D907 Terminology of Adhesives

D2864 Terminology Relating to Electrical Insulating Liquids and Gases

D4214 Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films

D4538 Terminology Relating to Protective Coating and Lining Work for Power Generation Facilities

E7 Terminology Relating to Metallography

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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.

- E131 Terminology Relating to Molecular Spectroscopy
- E135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials
- E344 Terminology Relating to Thermometry and Hydrometry
- E456 Terminology Relating to Quality and Statistics
- E631 Terminology of Building Constructions
- E856 Definitions of Terms and Abbreviations Relating to Physical and Chemical Characteristics of Refuse Derived Fuel (Withdrawn 2011)³
- E1187 Terminology Relating to Conformity Assessment (Withdrawn 2006)³
- E1227 Terminology for Chemical Analysis of Metals (Withdrawn 1991)³
- E1553 Practice for Collection of Airborne Particulate Lead During Abatement and Construction Activities (Withdrawn 2002)³
- 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
- E1727 Practice for Field Collection of Soil Samples for Subsequent Lead Determination
- E1728 Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination
- E1753 Practice for Use of Qualitative Chemical Spot Test Kits for Detection of Lead in Dry Paint Films
- E1777 Guide for Prioritization of Data Needs for Pavement Management
- E1792 Specification for Wipe Sampling Materials for Lead in Surface Dust
- E1796 Guide for Selection and Use of Liquid Coating Encapsulation Products for Leaded Paint in Buildings
- E1908 Guide for Sample Selection of Debris Waste from a Building Renovation or Lead Abatement Project for Toxicity Characteristic Leaching Procedure (TCLP) Testing for Leachable Lead (Pb)
- E1913 Guide for Conducting Static, Axenic, 14-Day Phytotoxicity Tests in Test Tubes with the Submersed Aquatic Macrophyte, *Myriophyllum sibiricum* Komarov (Withdrawn 2012)³
- E1914 Practice for Use of Terms Relating to the Development and Evaluation of Methods for Chemical Analysis (Withdrawn 2016)³
- E1979 Practice for Ultrasonic Extraction of Paint, Dust, Soil, and Air Samples for Subsequent Determination of Lead
- E2052 Guide for Evaluation, Management, and Control of Lead Hazards in Facilities (Withdrawn 2008)³
- E2115 Guide for Conducting Lead Hazard Assessments of Dwellings and of Other Child-Occupied Facilities
- E2239 Practice for Record Keeping and Record Preservation for Lead Hazard Activities
- E2255/E2255M Practice for Conducting Visual Assessments for Lead Hazards in Buildings
- E2271/E2271M Practice for Clearance Examinations Following Lead Hazard Reduction Activities in Multifamily Dwellings
- 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
- F141 Terminology Relating to Resilient Floor Coverings
- F221 Terminology Relating to Carbon Paper and Inked Ribbon Products and Images Made Therefrom (Withdrawn 2015)³
- F1156 Terminology Relating to Product Counterfeit Protection Systems (Withdrawn 2001)³
- G40 Terminology Relating to Wear and Erosion
- IEEE/ASTM SI-10 Standard for Use of the International System of Units (SI), the Modernized Metric System
- 2.2 *Code of Federal Regulations:*⁴
- 40 CFR 261 Identification and Listing of Hazardous Waste
- 40 CFR 745.223 Lead-Based Paint Poisoning Prevention in Certain Residential Structures—Definitions
- 40 CFR 745.226 Certification of Individuals and Firms Engaged in Lead-Based Paint Activities: Target Housing and Child-Occupied Facilities
- 40 CFR 745.227 Work Practice Standards for Conducting Lead-Based Paint Activities: Target Housing and Child-Occupied Facilities
- 2.3 *HUD Guidelines:*⁵
- HUD Guidelines Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing
- HUD Interim Guidelines Lead-Based Paint: Interim Guidelines for Hazard Identification and Abatement in Public and Indian Housing
- 2.4 *ISO Standards:*⁶
- ~~ISO/IEC Guide 99 International vocabulary of metrology -- Basic and general concepts and associated terms (VIM)~~
- ISO 9000:2000 Quality management systems -- Fundamentals and vocabulary

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

⁴ Available from U.S. Government Publishing Office (GPO), 732 N. Capitol St., NW, Washington, DC 20401, <http://www.gpo.gov>.

⁵ Available from U.S. Department of Housing and Urban Development (HUD), 451 7th Street, SW, Washington, DC 20410, <http://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>.

3. Significance and Use

3.1 The purpose of this terminology standard is to help users understand and apply the large number of specialized terms used in connection with the management of lead hazards by providing a single, comprehensive, and consistent terminology.

3.1.1 This terminology standard includes some terms that may be encountered, but whose use is discouraged. They are included for clarification and in order to provide the user with preferred existing alternate terms.

3.1.2 Architectural terms for individual building components are included to promote consistency of usage and to help ensure that sampling locations are recorded with sufficient accuracy to allow independent confirmation of lead measurements, if necessary.

3.2 A discussion is attached to certain definitions to help make the definition clear or to show how the term and its definition are related to other terms.

3.3 Terms and definitions in this terminology standard are based upon laws, regulations, and practices in the United States of America.

3.3.1 Some of the definitions in this terminology standard are adopted verbatim or are adapted from definitions that are formally stated or implied in laws and regulations. They are not intended to replace the latter definitions. The user is responsible for understanding legal definitions and for ensuring that the legal obligations that are encompassed by them are fully satisfied.

3.3.2 Users in other countries should refer to applicable national, regional, and local laws, regulations, and practices.

4. Terminology

abrasion resistance (coatings)—ability of a coating to resist being worn away and to maintain its original appearance, integrity, and structure when subjected to rubbing, scraping, or wear.

accessible surface—interior or exterior surface (usually up to 5 ft (1.5 m) from floor or ground) that is accessible for a young child to mouth or chew. See also **chewable surface**.

accreditation, *n*—Official authorization, approval, or recognition accorded an individual or organization based upon specific qualifications. **E631**

accuracy, *n*—the closeness of the agreement between the result of a measurement and a true value of the quantity that is being measured; a test result and an accepted reference value. **adapted E456 from draft ISO VIM, International Vocabulary of Basic and General Terms**

action level, *n*—a level of a contaminant in a medium at or above which activities to control the level are initiated.

DISCUSSION—

The action level may be a maximum allowable level, as in the definition of lead-containing paint. In other cases, it is defined as below a maximum allowable level, and used as a warning to prevent the latter from being exceeded. An example is the action level in the OSHA lead standard.

administrative controls—Administrative measures that are used to control occupational exposures to hazards.

DISCUSSION—

The most commonly used administrative controls are job assignments and job rotations that are designed to limit the duration of worker exposure. Another administrative control is purchase control to ensure the use of materials and equipment which produce the least amount of hazard.

administrative removal—(*of workers*), temporary removal of workers from a job site prior to blood-lead levels reaching values requiring medical removal.

analyte, *n*—chemical or element that is the subject of the testing or measurement in a sampling and analytical procedure, for example, lead in paint.

anodic stripping voltammetry—an electroanalytical technique in which the concentration of a metal species analyte (such as lead) in a solution is determined by deposition (by reduction) on an electrode, then stripping from it (by oxidation). The peak electrical current is measured during stripping, and is proportional to the original metal concentration.

DISCUSSION—

Commercial equipment is available to perform this method in the field as well as in fixed-site laboratories.

Apparent Lead Concentration (ALC)—The X-ray fluorescence (XRF) reading or average of more than one reading on a painted surface, not corrected for the substrate.

DISCUSSION—

This value was used in a now-obsolete method of correcting XRF readings for substrate effect, and has been replaced by use of the Performance Characteristic Sheet.

atomic absorption—absorption of radiant energy by ground-state atoms.

DISCUSSION—

Substances when dispersed as an atomic vapor will absorb characteristic radiations identical to those that the same substances can emit. This property is the basis for analysis by atomic absorption spectroscopy. **D2864**

baluster (picket), *n*—one of a series of closely-spaced upright members that support the handrail in a railing system. **E631**

bare soil, *n*—soil or sand not covered by grass, sod, other live ground covers, wood chips, gravel, artificial turf, or similar covering. **E2255/E2255M**

baseboard, *n*—a molding covering the juncture of a wall and the adjoining floor.

batch—a group of field or quality control samples that are processed together using the same reagents and equipment. **E1553**

bias, *n*—systematic error of the indication of a measuring instrument.the difference between the expectation of the test results and an accepted reference value. **E456**

biological monitoring—analysis of a person’s blood or urine, or both, to determine the level of lead contamination in the body.

blank sample—unexposed specimen of the *medium* used in testing, such as a wipe or a filter, which is analyzed with other samples to determine whether samples are either (1) contaminated before collection (for example, in the field, or at the testing site), or are (2) contaminated after collection (for example, during transportation to the laboratory or in the laboratory), or both. Also called a *media blank*, or a *dummy specimen*.

DISCUSSION—

Blank samples are also important in method validation.

blood-lead level (blood level)—concentration of lead in the blood, 1 $\mu\text{mole/L} = 20.72 \mu\text{g/mL}$.

DISCUSSION—

Blood lead levels are associated with the risk and severity of toxic effects.

calibration curve—graphical or mathematical representation of a relation between a measured parameter and a property of the standard for the substance under consideration. **C859**

calibration standard—solutions of known **analyte** concentration used to calibrate instruments. **E1613**

DISCUSSION—

Calibration standards must be matrix matched to the acid content present in sample digestates or extracts and must be measured prior to analyzing samples.

certification—the process of testing and evaluating against certain specifications the competence of a person, organization, or other entity in performing a function or service, usually for a specified period of time.

HUD Guidelines

Certified Reference Material (CRM)—a reference material accompanied by a certificate, one or more of whose property values are certified by a procedure that establishes its traceability to an accurate realization of the unit in which the property values are expressed. **E1644**

chalking, *n*—formation on a pigmented coating of a friable powder evolved from the film itself at or just beneath the surface. **D4214**

checking (coatings), *n*—phenomenon manifested in paint films by slight breaks in the film that do not penetrate to the underlying surface.

DISCUSSION—

The break should be called a crack if the underlying surface is visible. Where precision is necessary in evaluating a paint film, checking may be described as visible (as seen by the naked eye) or as microscopic (as observed under a magnification of ten diameters).

chewable surface—surface easily accessible to children (usually up to five feet from the floor or ground), and likely to be chewed-on, such as window sills, balusters, and handrails. See **accessible surface**.

child-occupied facility—a facility constructed prior to 1978 that is visited regularly by the same child, six years of age or under, at least two different days within any week, for at least three hours per visit, six hours per week, and 60 hours per year. **40 CFR 745.223, adapted**

chipping resistance (coatings)—ability of a coating or layers of coatings to resist removal, usually in small pieces, resulting from impact by hard objects or from wear during service. **D16**

clearance area, n—work area and additional spaces outside the work area where lead contamination may have occurred during lead hazard control and other building maintenance or modification activities. **E2271/E2271M and E3074/E3074M**

DISCUSSION—

The spaces outside the work area may include rooms connected to the work area, egress routes, waste storage areas, and grounds adjoining exterior work areas.

clearance examination, n—a process conducted after a lead hazard reduction activity, or other building maintenance and modification activities, to determine that no lead hazards remain in the area examined. **E2271/E2271M and E3074/E3074M**

clearance level, n—the amount of lead in samples collected during a clearance examination that is not to be equaled or exceeded so that a residential dwelling or child-occupied facility may be classified as adequately clean and safe for re-occupancy, as promulgated by authorities having jurisdiction. **E2271/E2271M and E3074/E3074M**

coating, n—a liquid or semiliquid, including but not limited to paint, varnish, or shellac, that dries or cures to form a protective or decorative finish after being applied as a thin layer. **D16**

Code of Federal Regulations (CFR)—basic component of the *Federal Register* publication system. The CFR is a codification of the regulations of the various Federal agencies.

common area, n—a portion of a building that is generally accessible to all occupants. Such an area may include, but is not limited to, hallways, stairways, laundry and recreational rooms, playgrounds, community centers, garages, and boundary fences. **40 CFR 745.223**

competence, n—demonstrated ability to apply knowledge and skills. **ISO 9000:2000 and E2239**

component, n—a building element using industrial products that are manufactured as independent units capable of being joined with other elements. **E631**

DISCUSSION—

For lead hazard assessment, a component of a building is normally identified by form, function, and location and may include exterior walls, interior room (type) walls, an interior windowsill in a bathroom, and so forth.

component (of the waste)—each of those different and distinguishable materials that comprise the waste. **E1908**

component replacement (building)—an abatement method in which painted components with leaded paint are removed with minimal disturbance of the paint, and replaced with new components.

concentration, n—quantity of substance in a unit quantity of sample.

DISCUSSION—

Lead in environmental media is expressed in SI units of mass concentration, for example, μg (micrograms) lead/g material, or in terms of loading, for example, $\mu\text{g lead/cm}^2$ of area (micrograms per square centimetre). Although the non-SI unit of micrograms per square foot is found in regulatory clearance testing of lead dust, its use is deprecated. (To convert from $\mu\text{g lead/ft}^2$ to $\mu\text{g lead/cm}^2$, divide by 929.11.)

conformity, n—fulfillment of a requirement. **ISO 9000:2000 and E2239**

containment, n—a physical barrier used to limit the spread of leaded dust and debris from a designated work area.

continuing calibration blank—a solution containing no analyte which is used to verify blank response and freedom from carryover. **E1613**

continuing calibration verification—a solution (or set of solutions) of known analyte concentration used to verify freedom from excessive instrumental drift; the concentration is to cover the range of a linear calibration curve. **adapted from E1613**

coring—method of collecting soil or paint samples that ensures that materials at each depth are collected proportionately, usually with a hollow cylindrical extraction device. **E1727**

cracking (coatings), n—phenomenon manifested in paint films by a break extending through to the surface painted. **D661**

DISCUSSION—

Where this is difficult to determine, the break should be called a crack only if the underlying surface is visible. The use of a magnification of 10 diameters is recommended in cases where it is difficult to differentiate between cracking and checking.

data collection objective—a statement explaining the reasons that certain data is needed, the questions it is expected to answer, and the decisions that will be made on the basis of the data, that is used in developing sampling and analytical plans.

delamination, n—(1) the separation of one coating from another coat within a coating system, or from the substrate; (2) the separation of layers in a laminated material such as plywood because of failure of the adhesive. **D4538 and D907, respectively**

deleading—activities conducted to eliminate lead-based paint or lead-based paint hazards in public buildings, commercial buildings, or steel structures.

detection limit—the lowest level of an analyte that can be detected by an instrument or an analytical method.

DISCUSSION—

There are different kinds of detection limits and it is important to know which one is being discussed.

instrumental detection limit—the lowest concentration at which the instrumentation can distinguish analyte content from the background generated by a minimal matrix. **E1613**

DISCUSSION—

The IDL is the limit of performance of the analytical instrument and is given in units of mass per unit volume.

method detection limit—the minimum concentration of an analyte that, in a given matrix and with a specific method, has a 99% probability of being identified, qualitatively or quantitatively measured, and reported to be greater than zero concentration. **E1613**

DISCUSSION—

(1) The method detection limit is different for each matrix, and is given in units that are specific to the matrix. (2) The method detection limit is always greater than or equal to the instrument detection limit.

deteriorated paint—paint or other coating that is cracking, flaking, chipping, peeling, or otherwise damaged or delaminating from the substrate of a building component.

digestate—an acidified aqueous solution produced by digestion.

digestion—a high temperature sample preparation process that solubilizes targeted analytes that may be present in the sample, and results in an acidified aqueous solution called the digestate. **E1913**

DISCUSSION—

Digestion normally entails the use of a hot plate or microwave oven for subjecting the acidified sample solution to high temperatures. Digestion is a type of **extraction**.

discipline, n—one of the specific types or categories of lead-based paint activities defined in applicable federal, state, or local regulations for which individuals may receive training from accredited training programs and become certified. **40 CFR 745.223, adapted**