



## Standard Terminology Relating to Lead in Buildings<sup>1</sup>

This standard is issued under the fixed designation E 1605; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This terminology standard includes 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 in reports and notices that are generated during lead hazard management activities.

1.2 This terminology standard is supplementary to Terminology E 631.

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

1.3.1 Some of the definitions in this 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.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

C 859 Terminology Relating to Nuclear Materials<sup>2</sup>

<sup>1</sup> This terminology is under the jurisdiction of ASTM Committee E-6 on Performance of Buildings and is the direct responsibility of Subcommittee E06.23 on Lead Hazards Associated with Buildings.

Current edition approved Nov. 10, 2000. Published January 2001. Originally published as E 1605 – 94. Last previous edition E 1605 – 95a.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 12.01.

D 16 Terminology for Paint and Related Coatings, Materials, and Applications<sup>3</sup>

D 123 Terminology Relating to Textiles<sup>4</sup>

D 661 Test Method for Evaluating Degree of Cracking of Exterior Paints<sup>3</sup>

D 772 Test Method for Evaluating Degree of Flaking (Scaling) of Exterior Paints<sup>3</sup>

D 2864 Terminology Relating to Electrical Insulating Liquids and Gases<sup>5</sup>

D 4214 Test Methods for Evaluating Degree of Chalking of Exterior Paint Films<sup>3</sup>

E 7 Terminology Relating to Metallography<sup>6</sup>

E 131 Terminology Relating to Molecular Spectroscopy<sup>7</sup>

E 135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials<sup>8</sup>

E 344 Terminology Relating to Thermometry and Hydrometry<sup>9</sup>

E 380 Practice for Use of the International System of Units (SI) (the Modernized Metric System)<sup>10</sup>

E 456 Terminology Relating to Quality and Statistics<sup>11</sup>

E 631 Terminology of Building Constructions<sup>12</sup>

E 856 Definitions of Terms and Abbreviations Relating to Physical and Chemical Characteristics of Refuse-Derived Fuel<sup>13</sup>

E 1227 Terminology Relating to Chemical Analysis of Metals<sup>14</sup>

F 221 Terminology Relating to Carbon Paper and Inked Ribbon Products and Images Made Therefrom<sup>15</sup>

#### 2.2 Code of Federal Regulations:

40 CFR 261 Identification and Listing of Hazardous Waste<sup>16</sup>

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 06.01.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 07.01.

<sup>5</sup> *Annual Book of ASTM Standards*, Vol 10.03.

<sup>6</sup> *Annual Book of ASTM Standards*, Vol 03.01.

<sup>7</sup> *Annual Book of ASTM Standards*, Vol 03.06.

<sup>8</sup> *Annual Book of ASTM Standards*, Vol 03.05.

<sup>9</sup> *Annual Book of ASTM Standards*, Vol 14.03.

<sup>10</sup> Discontinued 1997; Replaced by IEEE/ASTM SI-10.

<sup>11</sup> *Annual Book of ASTM Standards*, Vol 14.02.

<sup>12</sup> *Annual Book of ASTM Standards*, Vol 04.11.

<sup>13</sup> *Annual Book of ASTM Standards*, Vol 11.04.

<sup>14</sup> Discontinued; see 1991 *Annual Book of ASTM Standards*, Vol 03.05. Replaced by Terminology E 135.

<sup>15</sup> *Annual Book of ASTM Standards*, Vol 15.09

<sup>16</sup> Available from Office of the Federal Register, National Archives Records Administration, Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20401.

### 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.

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 young child to mouth or chew. See also **chewable surface**.

**accuracy, n**—degree of conformity of a measured or calculated value to some recognized standard or specified value.

DISCUSSION—This concept involves the systematic error of an operation, which is usually measurable. Compare **precision**.

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

**ALC**—apparent lead concentration.

**apparent lead concentration (ALC)**—the average of at least three XRF analyzer readings on a coated surface.

**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. (D 2864)

**baluster (picket), n**—one of a series of closely-spaced upright members that support the handrail in a railing system. (E 631)

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

**bias, n**—systematic error that contributes to the difference between a population mean of the measurements or test results and an accepted reference or true value. (E 456)

**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*.

**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.

**blood-lead testing**—testing by laboratories to determine the blood-lead level.

**building environmental survey**—for lead systematic inspection of a building and associated on-site paint, dust, soil, and water for the presence of lead compounds.

**calibration curve**—graphical or mathematical representation of a relation between a measured parameter and a property of the standard for the substance under consideration. (C 859)

**CFR—Code of Federal Regulations.**

**chalking, n**—formation on a pigmented coating of a friable powder evolved from the film itself at or just beneath the surface. (D 4214)

*characteristics*—see **hazardous waste characteristics**.

**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**.

**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. (D 16)

**CLC**—corrected lead concentration.

**cleanup, n**—wet-sweeping, HEPA-vacuuming, and washing down of surfaces within the work area at the end of each day. Compare **final cleanup**.

**coating, n**—liquid, liquefiable, or mastic composition that is converted to a solid protective, or decorative, or functional adherent film after application as a thin layer. (D 16)

**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**—room or area that is accessible to all tenants in a building or development (for example, hallway, vestibule, laundry area).

**components pattern**—process of identifying specific building components containing LBP at a hazardous level within a building or group of buildings.

**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,  $\mu\text{g}$  (micrograms) lead/g material, or in terms of loading, for example,  $\mu\text{g}$  lead/cm<sup>2</sup> 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<sup>2</sup> to  $\mu\text{g}$  lead/cm<sup>2</sup>, divide by 929.11.)

**container**, *n*—a usually portable device in which material is stored, transported, treated, disposed of, or otherwise handled.

**contingency plan**—document setting out an organized, planned, and coordinated course of action to be followed in case of an emergency, such as a fire or explosion, or a release of hazardous waste or hazardous waste constituents from a treatment, storage, or disposal facility that could threaten human health or the environment.

*contractor*—see **lead abatement contractor**.

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

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. (D 661)

**critical path method**—method of scheduling in a detailed manner the essential steps or actions that must be taken in sequence from the start to the completion of a construction project.

**defective paint surface**—paint that is cracking, flaking, chipping, or peeling from a building component (for example, window sill, door, or door frame).

**deleading**—deprecated term. Use **lead-based paint hazard abatement**.

**detection limit**—stated limiting value that designates the lowest concentration or mass that is capable of being estimated or determined with confidence and that is specific to the analytical procedures used.

**deteriorated condition**—condition of surfaces of such components as walls, windows, and baseboards that are in need of repair (or replacement) due to physical or mechanical breakdown of paint or other materials.

*direct-reading XRF*— see **XRF direct-reading analyzer**.

*discharge*—see **hazardous waste discharge**.

**disposal facility**—facility or part of a facility at which hazardous waste is intentionally placed into or on any land or water, and at which waste will remain contained after closure.

**door**, *n*—usually swinging or sliding barrier by which an entry is closed and opened. (E 631)

**dry scraping**—of coatings, method of removing dried, often deteriorated, paint film using a blade or similar tool.

DISCUSSION—This method may pose a health hazard. The surface is not wetted prior to scraping. Compare **wet scraping**.

*dummy specimen*— Use **blank sample**.

**dwelling**, *n*—building designed or occupied as the living quarters for one or more families or households. (E 631)

**dwelling unit**—unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation. (E 631)

**EBL**—elevated blood level.

**elevated blood level (EBL)**—lead content in blood that exceeds the safe level established by regulation/local jurisdiction.

*encapsulation*—see **lead-based paint encapsulation**.

**encephalopathy**, *n*—damage to the brain that is caused by severe lead toxicity that is capable of becoming permanent brain damage.

**engineered controls**—measures implemented at the work site to contain, control, or otherwise reduce exposure to lead dust and debris.

**EPA**—Environmental Protection Agency

**EPA identification**—unique number assigned by EPA to each generator or transporter of hazardous waste, and to each treatment, storage, or disposal facility.

**exterior work area**—outdoor porch, stairway, or other element of trim or walls on the exterior of a building.

*facility*—see **hazardous-waste facility**.

**Federal Register (FR)**—document published daily by the Federal Government that contains such entries as proposed or final regulations. See **CFR** and **Code of Federal Regulation**.

**field blank**—blank sample prepared at the field sampling location.

**final inspection**—inspection by a qualified inspector, industrial hygienist, or local public health official to determine whether abatement and cleanup meet applicable standards.

**flaking (scaling)**, *n*—phenomenon manifested in paint films by the actual detachment of pieces of the film itself either from its substrate or from paint previously applied.

DISCUSSION—Flaking (scaling) is generally preceded by cracking or checking or blistering, and is the result of loss of adhesion, usually due to stress-strain factors coming into play. (D 772)

**force account**—term describing PHA self-performance of modernization work by the use of employees, as distinct from performance by a contractor.

**glazing**, *n*—material installed in a window sash, ventilator, or panel such as glass, plastic. (E 631)

**hazardous waste**—liquid or solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics is capable of: (a) causing, or significantly contributing to an increase in mortality or to an increase in serious irreversible, or incapacitating reversible, illness; or (b) posing a substantial present or potential hazard to human health or to the environment when improperly treated, stored, transported, or

disposed of, or otherwise managed.

**hazardous-waste discharge**—accidental or intentional spilling, hazardous-waste leaking, pumping, pouring, emitting, discharge emptying, or dumping of hazardous wastes onto any land or water.

**hazardous-waste facility**—all contiguous land, structures, or other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste.

**hazardous-waste landfill**—disposal facility or part of a facility where hazardous waste is placed in or on land and that is not a land surface treatment facility, a surface impoundment, or an injection well.

*hazardous-waste manifest*—shipping document (EPA Form 8700-22) used for identifying the quantity, composition, origin, routing, and destination of hazardous waste during its transportation from the point of generation to the point of treatment, storage, or disposal.

**hazardous-waste small quantity generator**—generator who produces less than 100 kg of hazardous waste per month (or accumulates less than 100 kg at any one time) or one who produces less than 1 kg of acutely hazardous waste per month (or accumulates less than 1 kg of acutely hazardous waste at any one time).

**hazardous-waste storage**—holding on-site of hazardous waste for a temporary period, at the end of which the hazardous waste is treated, disposed of, or stored elsewhere.

**hazardous-waste treatment**—any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize it, or render it nonhazardous or less hazardous, or to recover it, make it safer to transport, store, or dispose of, or amenable for recovery, storage, or volume reduction.

**heat gun**—blower-equipped apparatus that emits heat with sufficient intensity to soften dried paint to permit scraping from the surface.

*HEPA filter*—see **high-efficiency particulate air filter**.

**high-efficiency particulate air (HEPA) filter**—filter capable of separating out particles of 0.3  $\mu\text{m}$  or greater from a body of air at 99.97 % efficiency or greater. See also **ULPA filter**.

**high-phosphate detergent**—detergent that contains the phosphate equivalent of at least 5 % tri-sodium phosphate (TSP).

**homogeneous surface**—surface that exhibits essentially the same appearance and properties at every point throughout the area examined.

**HUD**—U.S. Department of Housing and Urban Development.

**incinerator**—enclosed device using controlled-flame combustion in which waste materials are pyrolyzed or burned.

**industrial hygienist**—person certified by the American Board of Industrial Hygiene, or an industrial hygienist in training, or a person with equivalent education or experience or both.

**initial survey**—systematic inspection of a dwelling unit by a qualified inspector, using a portable XRF analyzer, atomic absorption spectroscopy, or other approved testing techniques, to determine whether a lead-based paint hazard is present.

**inspector**—person appointed by an authority to examine and evaluate designated domains for conformance to established

rules and regulations.

**interior work-area**—hallway, room, part of a room, or group of rooms in which a lead-hazard abatement activity takes place on the inside of a building.

**K-radiation, *n***—characteristic X-rays produced by an atom or ion when a vacancy in the K-shell is filled by one of the outer electrons. (E 135)

*landfill*—see **hazardous waste landfill**.

**landfill liner**—continuous layer of natural or man-made materials, beneath or on the sides of a surface impoundment, landfill, or landfill cell, which restricts the downward or lateral escape of hazardous waste, hazardous waste constituents, or leachate.

**LBP**—lead-based paint.

**lead abatement contractor**—any business entity, public unit, or person performing the actual abatement for a lead abatement project.

**lead-based paint removal**—action or process of abatement, that entails stripping lead-based paint from surfaces of components.

**lead-containing paint**—lead-based paint or other similar surface-coating materials containing lead or a lead compound, and in which the lead content is in excess of 0.06 % by weight of the total nonvolatile content of the paint, or the weight in the dried paint film.

**lead exposure**—subjection to the presence of a lead hazard that could result in ingestion or inhalation of lead-containing substances.

*DISCUSSION*—Typical exposure sources are LBP chips, dust, and contaminated soil; and occupational atmospheres as during LBP removal operations.

**lead paint hazard**—presence of lead-based paint in places and site conditions posing a danger of ingestion or inhalation.

**lead poisoning**—toxic condition caused by excessive exposure to lead.

*DISCUSSION*—In early stages most people are asymptomatic. However, some indicators of lead poisoning, particularly in children, are loss of interest in play, excessive sleeping, loss of recently-acquired skills, lack of energy, and headaches.

**lead positive/negative**—qualitative (not quantitative) judgment of lead content that determines abatement action measures.

*DISCUSSION*—The HUD guidelines consider  $>1.0 \text{ mg/cm}^2$  by XRF, or  $>0.5 \%$  by weight, (quantitative measures) as abatement action levels.

**lead dust**—dust containing lead or lead compounds at potentially hazardous concentrations.

*DISCUSSION*—The Federal legislative term (Section 302(c) of the Lead-Based Paint Poisoning Prevention Act) for a quantitative health-based dangerous level of lead in dust is lead-contaminated dust.

**lead paint**—paint or other coatings containing lead compounds at potentially hazardous concentrations.

*DISCUSSION*—Leaded paints having lead concentrations exceeding the Consumer Product Safety Commission's limit are called lead-containing paints, and those having concentrations exceeding the limits established under Section 302(c) of the Lead-Based Paint Poisoning Prevention Act are called lead-based paints. See **lead-containing paint** and **lead-based paint**.

*light (glazing) n*— use **lite**.

**lite, n**—one piece of glazing (preferred term); (also spelled light) (*synonym*—pane).

**logbook, n**—notebook that accompanies each XRF analyzer instrument, for recording such information as daily performance, maintenance problems, and average reading time.

**loose paint**—see **deteriorating paint**.

**L-radiation, n**—characteristic X-rays produced by an atom or ion when a vacancy in the L-shell is filled by one of the outer electrons. (E 135)

**MA**—Commonwealth of Massachusetts.

*manifest*—see **hazardous-waste manifest**.

**MD**—State of Maryland.

**mean value**—arithmetic average of data values; calculated as the algebraic sum of the data values divided by the number of data values.

DISCUSSION—When using an XRF, the mean value is the average of a series of numerical readings reported by the XRF.

**medical removal (of workers)**—temporary removal of workers from a job site due to elevated blood-lead levels as defined in HUD interim guidelines. Compare **administrative removal**.

**measurement, n**—act of quantifying a property or dimension. (D 123)

**microgram, µg, n**—one millionth of a gram.

DISCUSSION—453.59 g in a pound; 28 349 525 µg in 1 oz. (E 380)

**natural state**—condition of woodwork before priming and painting.

DISCUSSION—Natural state wood tests Pb negative.

**operator**—person having direct control of equipment or operation.

*owner*—see **property owner**.

**paint, n**—*in general*, a pigmented coating.

**paint residue**—dry or chemically softened paint that remains on a surface after initial paint removal. (D 16)

**paint scrapings**—waste material consisting of paint removed by wet or dry scraping during an abatement process.

*pane, n*— use **lite**.

*pattern*—see **components pattern**.

**personal air samples**— *airborne particulates*, samples of air collected from within the breathing zone of a person, but outside a respirator, if worn.

**Pb**—chemical symbol for the element, lead.

*Pb-positive/negative*— see **lead positive/negative**.

**pH**—chemical symbol meaning the (p)otential of (H)ydrogen ion, indicating a measure of acidity or alkalinity of an aqueous solution.

DISCUSSION—A neutral solution has a pH of seven. The numerical indicator increases with an increase in alkalinity, or decreases with an increase in acidity.

*PHA*—see **public housing agency**.

**precision**—degree of mutual agreement between individual measurements, namely repeatability and reproducibility. Compare **accuracy**. (F 221)

**primary prevention**—abatement of accessible lead-based

paint and paint residue to prevent the possibility of lead poisoning.

**property owner**—person, firm, corporation, guardian, conservator, receiver, trustee, executor, or other judicial officer who, alone or jointly or severally with others, owns, holds, or controls the whole or any part of the freehold or leasehold title to any property, with or without accompanying actual possession of it, and shall include in addition to the holder of legal title, any vendee in possession of it, but may not include a mortgagee or an owner of a reversionary interest under a ground rent lease.

**public housing agency (PHA)**—any state, county, municipality, or other government entity or public body (or agency or instrumentality thereof) that is authorized to engage or assist in the development or operation of housing for low-income families.

*random sample*—see **representative sample**.

**random sampling**—technique for selecting a sample of *n* elements from a population of elements in such a way that each combination of *n* elements has the same probability of being selected. (C 859)

**random sampling**—*in statistical sampling*, the process of selecting sample units in such a way that all units under consideration have the same probability of being selected.

**range, n**—region between the limits within which a quantity is measured, and is expressed by stating the lower and upper range-values. (E 344)

**RCRA**—Resource Conservation and Recovery Act of 1976.

**reading, n**—numerical value obtained from a digital display or indicated on a scale or dial of an apparatus or instrument. (E 1227)

**reference material**—material of definite composition that closely resembles in chemical and physical nature the material with which the analyst expects to deal, and that is employed for calibration or standardization. (E 131)

**representative sample**—sample of a universe or whole (for example, waste sample pile, lagoon, ground water, or waste stream), selected in a random sampling process, which represents the total properties in the universe or whole.

**Resource Conservation and Recovery Act of 1976**—an amendment to the Solid Waste Disposal Act of 1965.

DISCUSSION—RCRA was amended in 1980 and most recently on November 8, 1984 by the Hazardous and Solid Waste (HSW) Amendments.

**sample, n**—a portion of material taken from a larger quantity for the purpose of estimating properties or composition of the larger quantity.

**sash, n**—single frame in a door or window that holds one or more lites (panes) of glass. See **window sash**.

*scaling*—see **flaking**.

**secondary sources (of lead)**—sources of lead exposure other than lead-based paint.

DISCUSSION—Secondary sources can include some newsprint inks, some ceramic glazes, bullets, storage batteries, and soil.

*SEL*—see **substrate equivalent lead concentration**.

*shoot*—see **XRF-shoot**.

*small quantity*—see **hazardous-waste small quantity generator**.

**sodium rhodizonate method**—for *lead detection*, use of a dilute solution of sodium rhodizonate to spot test a painted surface qualitatively for the presence of lead.

**sodium sulfide method**—for *lead detection*, use of a dilute solution of sodium sulfide to spot test a painted surface qualitatively for the presence of lead.

*specimen*—See **test specimen**.

*spectrum analyzer XRF*— see **XRF spectrum analyzer**.

**standard deviation (in statistics)**—a measure of the precision of the readings, the average deviation of the deviations from the mean value.

DISCUSSION—The smaller the standard deviation, the more precise the analysis, and the less variation there is when an analysis is repeated. The standard deviation is calculated by first obtaining the mean (arithmetic average) of all of the readings. A formula is then used to calculate how much the values vary from the mean (standard deviation = the square root of the arithmetic average of the squares of the deviations from the mean). Many hand calculators have an automatic standard deviation function.

*storage*—see **hazardous-waste storage**.

**substandard dwelling**—dwelling or residence that does not meet minimum local housing codes, or is unsafe because of violation of fire, safety, or health codes.

**substrate base**—unfinished building-material surface to which finishes are applied. Examples include wood, plaster, dry-wall, masonry, and metal.

*substrate effect*—see **XRF substrate effect**.

**substrate equivalent lead concentration (SEL)**—average of at least three XRF analyzer readings on a surface from which the coating has been removed.

**test, n**—critical examination of the quality, composition, or properties of a material, usually involving standardized test procedures.

**test specimen**—portion of a test unit needed to obtain a single test determination.

DISCUSSION—When used for a physical test, this is sometimes called *test piece*. For a chemical test, it is sometimes called *test portion* or *test sample*. For optical and other tests, it is also sometimes called *test sample*. In interlaboratory evaluation of test methods and other statistical procedures, it is best to reserve the word **sample** for the whole amount of material involved and not the individual test specimens, pieces, or portions being tested. (E 456)

**toxicity characteristic leaching procedure (TCLP)**—a mild laboratory extraction procedure designed to determine the mobility of organic and inorganic constituents present in liquid, solid, and multiphasic wastes.

DISCUSSION—The Environmental Protection Agency TCLP procedure is provided in 40 CFR 261, Appendix II.

*treatment*—see **hazardous-waste treatment**.

**TSD facility**—facility for treatment, storage, or disposal of hazardous waste.

**TSP**—tri-sodium phosphate.

**µg**—microgram.

**ULPA filter**—ultra-low-penetration air filter.

**ultra-low-penetration air (ULPA) filter**— filter capable of separating out particles of 0.13 µm or greater from a body of

air at 99.9995 % efficiency or greater. See also **HEPA filter**.

*unit*—see **dwelling unit**.

*verification*—see **calibrate**.

**volatile materials**—materials, particularly chemicals such as organic solvents that are readily vaporized at room temperature.

**wall, n**—part of a building that divides spaces vertically. (E 631)

**window, n**—assembly consisting of a surrounding frame, and one or more window sashes, ventilators, or fixed lites (panes) of glass, or a combination of these, designed to be installed in a wall opening for the purpose of admitting light or air, or both.

**window frame, n**—assembly of structural members that surrounds and supports the sash, ventilators, doors, panels, or glazing that is installed into an opening in a building envelope or wall. (E 631)

**window sash**—assembly of one or more lites (or panes) of glazing, encompassed by surrounding edge members, which when operable, slides in the plane of the window. (E 631)

**window stool**—flat, horizontal molding fitted over the sill, on the window interior, between jambs, that comes in contact with the bottom rail of the (lower) operating sash and the window sill.

**work area**—assigned space within a building, or at an exterior location, that is designated as the region delineated by the scope of work.

*work-practice control*— see **engineered control**.

**XRF sample site**—specific spot on a surface being tested for lead concentration by portable or laboratory XRF equipment.

**XRF direct-reading analyzer**—an analyzer that provides the operator with a display of a lead concentration calculated from the lead “K” x-ray intensity. Compare **XRF spectrum analyzer**.

**XRF reading cycle-XRF direct-reading analyzers**—calculate the lead “K” x-ray intensity in a specific time interval (10 to 30 s) that is fixed by the manufacturer and related to the age of the source. The calculated result in this time interval is a *reading cycle*.

DISCUSSION—In order to determine a concentration of lead (ALC or SEL) the displayed results of a *minimum of three* single reading cycles must be averaged. The difference between the lowest and highest readings from at least three reading cycles must be less than 1.7 mg/cm<sup>2</sup>.

**XRF analyzer**—instrument that determines lead concentration, using the principle of X-ray fluorescence.

DISCUSSION—For coatings, the concentration normally is expressed in milligrams per square centimetre (mg/cm<sup>2</sup>).

**XRF-shoot, v**—to obtain the results of an XRF single reading cycle.

**XRF spectrum analyzer**—type of XRF analyzer that provides the operator with a plot of the energy and intensity of both “k” and “L” x-rays, as well as a calculated concentration of lead. Compare **XRF direct-reading analyzer**.

**XRF substrate effect**—return of backscattered radiation from paint, substrate, or underlying material to the XRF analyzer.

DISCUSSION—This radiation when counted as lead x-rays by an XRF contributes to SEL or bias. The inspector may have to compensate for this effect when using direct-reading XRF analyzers.

*This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.*

*This standard is copyrighted by ASTM, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or [service@astm.org](mailto:service@astm.org) (e-mail); or through the ASTM website ([www.astm.org](http://www.astm.org)).*