



Designation: E 1908 – 97

AMERICAN SOCIETY FOR TESTING AND MATERIALS
100 Barr Harbor Dr., West Conshohocken, PA 19428
Reprinted from the Annual Book of ASTM Standards. Copyright ASTM

Standard 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)¹

This standard is issued under the fixed designation E 1908; 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 guide describes a method for selecting samples from the debris waste stream created during demolition, renovation, or lead abatement projects. The lead toxicity of the waste then is determined by analysis of the leachate resulting from use of the Toxicity Characteristic Leaching Procedure (TCLP).

1.2 This guide is intended for use to sample debris waste created by renovation or lead abatement projects in and around buildings and related structures to determine the lead (Pb) toxicity of the waste.

1.3 This guide is intended for use when sampling to test for lead (Pb) only and does not include sampling considerations for other toxic metals or for toxic organic compounds. This guide also does not include consideration of sampling for determination of other possible hazardous characteristics of the waste.

1.4 This guide assumes that the individual type debris wastes are at least partially segregated and that each type waste may be viewed easily.

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:

D 4840 Practice for Sampling Chain of Custody Procedures²

E 105 Practice for Probability Sampling of Materials³

2.2 Federal Documents:

Title 40, Code of Federal Regulations, Part 261, Appendix

II-Method 1311, Toxicity Characteristic Leaching Procedure (TCLP)⁴

Interim Final Report, Lead-Based Paint Contaminated Debris-Waste Characterization Study No. 37-26-JK 44-92, May 1992–May 1993⁵

2.3 OSHA Standard:

OSHA Lead in Construction Standard, 29 CFR 1926.62⁶

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *component (of the waste), n*—each of those different and distinguishable materials that comprise the waste. Also may be defined by locally-applied law or regulation.

3.1.2 *sample (of the waste), n*—a collection of the components of the waste assembled in proportion to their contribution to the total volume of the waste. Also may be defined by locally-applied law or regulation.

3.1.3 *waste, n*—material resulting from conduct of a demolition, renovation, or lead abatement project that is or will be directed for disposal. Also may be defined by locally-applied law or regulation.

3.1.4 *waste stream, n*—the total flow of waste from a demolition, renovation, or lead abatement project. Also may be defined by locally-applied law or regulation.

4. Summary of Practice

4.1 The entirety of the waste created by renovation or lead abatement projects in and around buildings and related structures is examined visually, and estimates made of the total volume of the waste and of the relative volume proportions of the various components of the waste. A sample of the waste is selected and assembled that contains the various waste components in the same relative volume proportions as these estimates. The sample then is submitted to a laboratory for conduct of the TCLP procedure and analysis for lead as defined within those procedures.

¹ This guide is under the jurisdiction of ASTM Committee E-6 on Building Performance and is the direct responsibility of E06.23 on Abatement of Hazards from Lead in Buildings and Related Structures

Current edition approved Sept. 10, 1997. Published May 1998

² Annual Book of ASTM Standards, Vol 11.01.

³ Annual Book of ASTM Standards, Vol 14.02.

⁴ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁵ Available from Commander, U.S. Army Environmental Center, ATTN: SFIM-AEC-EC, Bldg. E4435, Aberdeen Proving Ground, MD 21010-5401.

⁶ Available from OSHA.

 E 1908

NOTE 1—It is prudent to contact the analytical laboratory to determine how laboratory personnel intend to or should process the sample prior to subsampling for conduct of the TCLP.

4.2 The collection of a volume-based sample of the waste stream requisite in this guide is based on the fact that the TCLP leachate lead (Pb) concentration limit, like other such TCLP limits, was developed based on the spatial dimensions of landfills.

5. Significance and Use

5.1 The TCLP procedure is used to simulate the transfer of lead from lead-containing waste into the ground water system upon codisposal of the lead-containing waste and municipal solid waste in unlined solid waste landfills. The TCLP attempts to simulate rain or ground water leaching, or both, of lead from the buried waste. In order for the procedure to yield an accurate predictor of the subsurface (in-ground) leaching process, a representative sample of the volume of the waste must be selected and submitted for leaching and analysis. The result of the sampling, leaching, and analysis process is used to determine the waste handling and disposal protocols to be followed and to document compliance with applicable laws, regulations, and requirements. The guide addresses the sampling process by defining a component-volume-based method to collect and assemble a representative sample of a solid waste stream that may contain heterogeneous components.

5.2 Individuals who use this guide are expected to be trained in the proper and safe conduct of sampling of lead-containing wastes, qualified/certified/licensed as required by those authorities having jurisdiction over such activities, and properly utilize tools and safety equipment when conducting these procedures.

5.3 This guide may involve use of various hand and power tools for the breaking, cracking, crushing, cutting, grinding, etc., of components of the waste. It is intended that such tools should be properly and safely used by persons trained and familiar with their performance and use.

5.4 This guide is suitable for use to sample or multiple component wastes.

5.5 In the unique case where an entire building is the waste, consideration should be given to use of the sampling protocol proposed in the *Interim Final Report, Lead-Based Paint Contaminated Debris – Waste Characterization Study No. 37-26-JK44-92, May 1992 – May 1993*. In general terms, building components are drilled to collect subsamples in proportion to the volume of that component in the entire building. The subsamples are composited, and the resulting integrated sample is tested by the TCLP protocol.

6. Apparatus

6.1 Various hand and power tools as needed for the breaking, cracking, crushing, cutting, grinding, etc., of components of the waste.

6.2 *Personal Protective Equipment (PPE) and Systems*, as appropriate for the safe collection, handling, breaking, cracking, crushing, cutting, grinding, etc., of components of the waste.

NOTE 2—At minimum, consider those requirements contained in the OSHA Lead in Construction Standard, 29 CFR 1926.62, for exposure to

lead. The presence of other chemical hazards may necessitate the application of other such standards. The physical hazards associated with operation of such equipment will necessitate the application of other standards for machine and tool guarding, safe use of power systems and power tools, etc.

6.3 *Containers*, of construction, size, and number to hold and fully contain the waste samples. These may be available from the laboratory to which samples of wastes are to be sent for analysis.

6.4 *Markers*, pens, self-adhesive labels, etc., for use to provide positive identification of the samples of waste assembled or collected, or both.

6.5 *Chain of Custody Forms*, similar to those described in Practice D 4840 or as described in an equivalent standard or protocol. These forms may be available from the laboratory to which samples of wastes are to be sent for analysis.

7. Procedure

7.1 Determining the Volume Proportions of the Sample:

7.1.1 Estimate the total volume of the waste components in units of cubic meters[m³]. Then, estimate the volume that each component contributes to the total volume of the waste. The sum of the component volumes should equal the total volume.

NOTE 3—If the volume estimate was made in units of cubic feet[ft³], convert to cubic meters[m³], by multiplying the value in [ft³], by 0.028 as follows:

$$1 \text{ ft}^3 = 0.028 \text{ m}^3$$

NOTE 4—If the volume estimate was made in units of cubic yards[yd³], convert to cubic meters[m³], by multiplying the value in [yd³] by 0.76 as follows:

$$1 \text{ yd}^3 = 0.76 \text{ m}^3$$

7.2 Collecting a Volume Proportional Sample:

7.2.1 Using the volume proportions of the painted waste components, randomly collect and assemble a sample of between 0.25 kg and 1 kg total. After preanalysis processing, this should be enough to yield multiple 100-g subsamples. Follow ASTM E 105 to assure that what is collected is truly representative. This sample of the waste is to be sent to the laboratory for analysis. The entire material submitted is the sample and must be handled accordingly. The sample shall be broken, cracked, crushed, cut, ground, etc., as a whole and must be homogenized before a subsample is taken for conduct of TCLP.

7.2.2 For example, assume that the project involved removal and disposal of painted doors, door frames, windows, window frames or trim molding or both from several rooms. Assume further that any glass removed is to be recycled. Segregated waste piles (best situation) might then contain metal doors, wood doors (solid and hollow separately), metal door and window frames (no glass), wood door and window frames (no glass), and wood molding. As in 7.1, estimate the volume of the waste in each pile and calculate the volume proportions. See Table 1. As in 7.2, use the volume proportions to collect subsamples. The compilation of the subsamples is the sample to be submitted to the laboratory for analysis. In this example, the sample would be 15 % wood from window frames.

8. Sample Handling

8.1 Introduce the entire sample into and securely close the