



# 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)<sup>1</sup>

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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This guide describes a method for selecting samples of building components coated with paints suspected of containing lead. The samples are collected from the debris waste stream created during demolition, renovation, or lead hazard control, or abatement projects. The lead toxicity of samples are subsequently analyzed in 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 laboratory for use to sample lead.~~

~~1.1.1 The debris waste created by renovation or lead abatement projects in and around buildings and related structures stream is assumed to determine the lead (Pb) toxicity of the waste.~~

~~1.3 This have more than one painted component, for example, metal doors, wood doors, and wood window trim.~~

1.2 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.

1.43 This guide assumes that the individual component types comprising the debris waste stream are at least partially segregated and that the volume of each type of component in the debris waste stream may be viewed easily.

~~1.5 estimated.~~

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 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 Procedures<sup>2</sup>

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

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E 105 Practice for Probability Sampling of Materials<sup>3</sup>

E 2239 Standard Practice for Record Keeping and Record Preservation for Lead Hazard Activities<sup>4</sup>

2.2 *Federal Documents:*

~~Title 40, Code~~

~~40 CFR (Code of Federal Regulations;)~~ Part 261, Appendix II-Method 1311, Toxicity Characteristic Leaching Procedure (TCLP)<sup>5</sup>

Interim Final Report, Lead-Based Paint Contaminated Debris–Waste Characterization Study No. 37-26-JK 44-92, May 1992–May 1993<sup>6</sup>

2.3 *OSHA Standard:*

~~29 CFR 1926.62, OSHA Lead in Construction Standard,~~ 29 CFR 1926.62<sup>6</sup> Standard<sup>4</sup>

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 11.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 14.02.

<sup>4</sup> Available from Superintendent

<sup>4</sup> *Annual Book of Documents, U.S. Government Printing Office, Washington, DC 20402; ASTM Standards*, Vol 4.12.

<sup>5</sup> Available from ~~Commander, Superintendent of Documents, U.S. Army Environmental Center, ATTN: SFIM-AEC-EC, Bldg. E4435, Aberdeen Proving Ground, MD 21010-5401;~~ Government Printing Office, P.O. Box 371954, Pittsburgh, PA 15250-7954. Also available from <http://www.gpo.gov/nara/cfr/index.html>.

<sup>6</sup> Available from ~~OSHA Commander, U.S. Army Environmental Center, ATTN: SFIM-AEC-EC, Bldg. E4435, Aberdeen Proving Ground, MD 21010-5401.~~ Also available from [http://chppm-www.apgea.army.mil/lahome/docs/lead\\_list.htm](http://chppm-www.apgea.army.mil/lahome/docs/lead_list.htm).

### 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.~~ waste.

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.~~ waste.

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.~~ disposal.

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~~ hazard control 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.~~ project.

NOTE 1—~~Regulations promulgated by authorities having jurisdiction can~~ may define terms in 3.1.1-3.1.4 differently than defined above.

### 4. Summary of Practice

4.1 ~~The entirety of the analytical laboratory to determine how laboratory personnel intend to~~ debris waste stream created by demolition, renovation, lead hazard control or abatement projects in and around buildings and related structures is examined visually, and estimates made of the sample prior to subsampling for conduct total volume of the TCLP.

4.2 ~~The collection waste and of the relative volume proportions of the various components of the waste. A sample of the waste stream requisite in this guide is based on the fact selected and assembled that contains the TCLP leachate lead (Pb) concentration limit, like other such TCLP limits, was developed based on various waste components in the same relative volume proportions as these estimates. The sample is then submitted to a laboratory for conduct of landfills—the Toxicity Characteristic Leaching Procedure (TCLP) for lead.~~

### 5. Significance and Use

5.1 Waste samples collected using this guide provide representative samples for analysis in a laboratory using the TCLP.

5.2 ~~The TCLP procedure is used to simulate the transfer of lead from buried 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 both. For the buried waste. In order for the procedure to yield an accurate a 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.~~

5.23 ~~The collection of a volume-based sample of the waste stream is based on the fact that the TCLP leachate lead concentration limit, like other such TCLP limits, was developed based on the spatial dimensions of landfills.~~

5.4 ~~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.~~

5.35 ~~This guide may involve use of various hand and power tools for sampling 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~~

5.6 ~~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 samples of the various components in proportion to the volume of those components in the entire building. The subsamples component samples are composited, assembled, and the resulting integrated assembled sample is tested by analyzed according to the TCLP protocol.~~

### 6. Apparatus

#### 6.1 ~~Various hand~~ Sampling Supplies

6.1 ~~Hand and Power Tools,~~ as needed for the breaking, cracking, crushing, cutting, grinding, etc., sampling and handling of the various components of the waste (e.g., saws, metal snips).

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

NOTE 2—~~At minimum, consider those~~ Those requirements contained in the OSHA Lead in Construction Standard, 29 CFR 1926.62, for exposure to lead, may be considered. The presence of other chemical hazards in the waste 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., standards.

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

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

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

## 7. Procedure

### 7.1 ~~Determining~~ Determine the Volume Proportions of the Sample:

7.1.1 Estimate the ~~total volume of the waste components in units~~ each pile of cubic meters [m<sup>3</sup>]. Then, estimate painted waste that has been segregated according to component type, for example metal doors, wood doors, and wood window trim.

7.1.2 Calculate the ~~volume that proportion of each component contributes to type as a percent of~~ the total volume of the waste. The sum of the component volumes should equal the total volume. waste.

NOTE 3—If the volume estimate was made in units of cubic feet [ft<sup>3</sup>], convert to cubic meters [m<sup>3</sup>] by multiplying the value in ~~ft cubic feet (ft<sup>3</sup>)~~ by 0.0283 as follows:

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

$$0.0283 \times (\text{volume in cubic feet}) = (\text{volume in cubic meters})$$

NOTE 4—If the volume estimate was made in units of cubic yards [yd<sup>3</sup>], convert to cubic meters [m<sup>3</sup>] by multiplying the value in ~~yd cubic yards (yd<sup>3</sup>)~~ by 0.765 as follows:

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

$$0.765 (\text{volume in cubic yards}) = (\text{volume in cubic meters})$$

### 7.2 ~~Collecting~~ Collect a Volume Proportional Sample:

7.2.1 ~~Using the volume proportions of the painted waste components,~~

7.2.1 Collect randomly collect and assemble a waste sample of having a mass between 0.25 kg and 1 kg total. After preanalysis processing, this should be enough to yield multiple 100-g subsamples. kg. Follow ASTM E 105 to assure that what is the material collected is truly representative. This sample (Note 5)

NOTE 5—After preanalysis processing by the laboratory, this amount of the waste is to should be sent enough to the laboratory for analysis. The entire material submitted is the sample and must be handled accordingly. The sample yield a minimum of two 100-g TCLP specimens.

7.2.2 The amount collected from each pile shall be broken, cracked, crushed, cut, ground, etc., as a whole and must be homogenized before a subsample is taken for conduct according to the volume proportion of TCLP.

7.2.2 For each pile. (Note 6)

NOTE 6—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 removed 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 7.1.1, estimate the volume of the waste in each pile and calculate the volume proportions. See Table 1. As in 7.2.2, use the volume proportions to collect subsamples. The compilation of the subsamples is the sample to be submitted to the laboratory for analysis. appropriate amount of material from each pile. In this example, the sample would be 157 % wood by volume from window frames.

**TABLE 1 Example of Determining Volume Proportions**

Painted Component	Estimated Volume	Volume Proportion
wood doors, solid	0.081 m <sup>3</sup>	44 % (= 0.082/0.186)
wood doors, solid	0.081 m <sup>3</sup>	50 % (= 0.082/0.186)
door frames, wood	0.020 m <sup>3</sup>	12 %
door frames, wood	0.020 m <sup>3</sup>	12 %
windows, wood	0.031 m <sup>3</sup>	17 %
windows, wood	0.031 m <sup>3</sup>	17 %
window frames, steel	0.003 m <sup>3</sup>	2 %
window frames, wood	0.028 m <sup>3</sup>	15 %
window frames, wood	0.028 m <sup>3</sup>	15 %
paint, 11.6 m <sup>2</sup> , 2-mm thick	0.023 m <sup>3</sup>	12 %
total	0.186 m <sup>3</sup>	101 % (due to rounding)
total	0.163 m <sup>3</sup>	100 %

## 8. Sample Handling and Analysis

### 8.1 ~~Preparation for Shipment~~

~~8.1.1 Prepare the entire total amount of waste collected as the sample from each pile for shipment (7.2.2) to a laboratory for analysis. (Note 7)~~

~~NOTE 7—All the material sent to the laboratory comprises a single sample of the debris waste stream that is broken, cracked, crushed, cut, ground, etc., as a whole and securely close is homogenized before a subsample is taken for TCLP analysis.~~

~~8.1.1.1 Place the total amount of waste collected as the sample into one or more container(s). Assure that each container is securely closed completely and will not allow to prevent sample loss or contamination during handling and transportation.~~

~~8.2 Mark, or otherwise label,~~

~~8.2 Label each sample container with a unique identifier.~~

~~8.3 Complete the request-for-analysis paperwork as required by the laboratory for analysis of the waste sample. Advise the laboratory of the number and types of containers sent and the means and methods of delivery, and that TCLP for lead is to be performed. (Note 8).~~

~~NOTE 8—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.~~

~~8.4 Complete a Chain of Custody form such as described in Practice D 4840.~~

~~8.4.1 Record the sample container identifiers on the Chain of Custody form.~~

~~8.5 Package the sample container(s) for shipment and label the over-pack, if one is used, according to applicable transportation laws and regulations.~~

~~8.5.1 Enclose the completed Chain of Custody form in the shipment package.~~

~~8.6 Ship the packaged waste sample to a laboratory for analysis~~

## 9. Report

~~9.1 Documentation—Report the following information for identification of the waste including:~~

~~9.1.1 A full description of the project and site from which the waste was sampled including names, addresses, locations, waste-producing processes, and dates.~~

~~9.1.2 A full description of the waste stream from which each sample was taken.~~

~~9.1.3 A list and description of the components of each waste sampled.~~

~~9.1.4 The estimated volumes used to assemble the waste sample.~~

~~9.2 Sample Submission:~~

~~9.2.1 Complete a Chain of Custody form as described Record Keeping~~

~~9.1 Records shall be maintained in Practice D 4840, or an equivalent standard or protocol, and enclose it accordance with the sample(s) sent to the laboratory. Retain a copy.~~

~~9.2.2 Complete request-for-analysis paperwork as required by the laboratory for analysis of the sample(s) E 2239 and advise the laboratory of the number and types(s) of sample(s) sent and the means and methods of delivery, and that TCLP for lead (Pb) is to be performed. Retain shall include, at a copy of this paperwork as minimum, a record of the submission and analysis request.~~

~~9.2.3 Retain a copy of any packing list(s) or shipping papers, or both, that are used. the report.~~

## 10. Report

~~10.1 A report shall be prepared and include at a minimum the following:~~

~~10.1.1 A description of the project and site from which the waste was sampled including names, addresses, locations, waste-producing processes, and dates.~~

~~10.1.2 A list and description of the components sampled from the waste stream.~~

~~10.1.3 The estimated volumes of each component waste pile.~~

~~10.1.4 The calculated volume proportion of each component comprising the entire waste sample.~~

~~10.1.5 A copy of the Completed Chain of Custody Form.~~

~~10.1.6 A copy of paperwork that was prepared as a record of the laboratory submission and analysis request.~~

~~10.1.7 A copy of any packing list(s) or shipping papers, or both, used in shipment of the waste sample to the laboratory.~~

## 11. Keywords

~~10.1.1 abatement; lead; lead abatement; lead; TCLP; lead; waste; waste; lead waste~~

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