



Designation: **D7296—12 D7296 – 18**

Standard Practice for Collection of Settled Dust Samples Using Dry Wipe Sampling Methods for Subsequent Determination of Beryllium and Compounds¹

This standard is issued under the fixed designation D7296; 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 dust containing beryllium ~~and/or~~ and beryllium compounds on surfaces using the dry wipe sampling ~~method—method, or both~~. These samples are collected in a manner that will permit subsequent extraction and determination of beryllium and compounds in the wipes using laboratory analysis techniques such as atomic spectrometry or fluorescence detection.

1.2 This practice is limited in its scope to applications where wetted wipe sampling (using Practice **D6966**) or vacuum sampling (using Practice **D7144**) is not physically feasible (for example, if the surface to be wiped would be compromised by use of wetted wipes).

1.3 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, hazard evaluation, risk assessment, and other purposes. To provide for valid conclusions, sufficient numbers of samples should be obtained as directed by a sampling plan. Additional guidance is provided in Guide **D7659**.

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

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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

1.7 *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.*

<https://standards.iteh.ai/catalog/standards/sist/6f517b7a-c696-4e4a-ba34-e76baf63abfd/astm-d7296-18>

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

D7144 Practice for Collection of Surface Dust by Micro-vacuum Sampling for Subsequent Metals Determination

D7659 Guide for Strategies for Surface Sampling of Metals and Metalloids for Worker Protection

D7707 Specification for Wipe Sampling Materials for Beryllium in Surface Dust

3. Terminology

3.1 For definitions of terms not listed here, see Terminology **D1356**.

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.

¹ This practice is under the jurisdiction of ASTM Committee **D22** on Air Quality and is the direct responsibility of Subcommittee **D22.04** on Workplace Air Quality. Current edition approved April 1, 2012; Nov. 1, 2018. Published May 2012; November 2018. Originally approved in 2006. Last previous edition approved in 2006 as **D7296—06**; **D7296 – 12**. DOI:10.1520/D7296-12; DOI:10.1520/D7296-18.

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.

~~3.2.2 *sampling location, n*—a specific area within a sampling site that is subjected to sample collection. **D6966**~~

~~3.2.2.1 *Discussion*—~~

~~Multiple sampling locations are commonly designated for a single sampling site (see 3.2.3).~~

~~3.2.3 *sampling site, n*—a local geographic area that contains the sampling locations (see 3.2.2). **D6966**~~

~~3.2.3.1 *Discussion*—~~

~~A sampling site is generally limited to an area that is easily covered by walking.~~

~~3.2.2 *dry wipe, n*—a suitable non-wetted wiping medium.~~

~~3.2.2.1 *Discussion*—~~

These are to be distinguished from wipes as defined in Practice **D6966** and Specification **D7707**, which are wet wipes.

3.3 *Definitions of Terms Specific to This Standard:*

3.3.1 *field blank, n*—a dry wipe (see ~~3.2.4~~**3.2.2**) 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 dry wipe, combined with the potential contamination experienced by samples collected within the batch (see **3.2.1**) resulting from handling.

4. Summary of Practice

4.1 Wipe samples of settled dust are collected on surfaces from areas of known dimensions with dry wipes satisfying certain requirements, using a specified pattern of wiping.

4.2 The collected dry wipes are then ready for subsequent sample preparation and analysis for the measurement of beryllium and compounds.

5. Significance and Use

5.1 This practice is intended for the collection of settled dust samples for the subsequent measurement of beryllium and compounds. The practice is meant for use in the collection of settled dust samples that are of interest in clearance, hazard evaluation, risk assessment, and other purposes.

5.2 This practice is intended solely for the collection of settled dust samples from hard, relatively smooth nonporous surfaces that may be compromised by water or other wetting agents and that are therefore not suitable for wet wipe sampling using Practice **D6966** or micro-vacuum sampling using Practice **D7144**. Use of this practice for any purpose other than the intended purpose is discouraged due to the limited collection efficiency and high variability of dry wipe sampling as compared to wetted wipe or micro-vacuum sampling.³

5.3 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. Micro-vacuum sampling using Practice **D7144** may be more suitable for these surfaces.

6. Apparatus

6.1 *Sampling Templates*—One or more of the following: 10 cm by 10 cm (minimum dimensions) reusable or disposable aluminum or plastic template(s), or disposable cardboard templates, (full-square, rectangular, square “U-shaped,” rectangular “U-shaped,” or “L-shaped,” or both); or templates of alternative areas having accurately known dimensions (see **Note 1**). Templates shall be capable of lying flat on a surface.

NOTE 1—For most surfaces, it is recommended to collect settled dust from a minimum surface area of 100 cm² to provide sufficient material for subsequent laboratory analysis. However, larger areas (for example, 30 cm by 30 cm) may be appropriate for surfaces having little or no visible settled dust, while a smaller sampling area (for example, 10 cm by 10 cm) may be appropriate for surfaces with high levels of visible settled dust. It is recommended to have a suite of templates with various sampling dimensions.

³ Dufay, S. K., and Archuleta, M., M., “Comparison of Collection Efficiency of Sampling Methods for Removable Beryllium Surface Contamination,” *J. Environ. Monit. Journal of Environmental Monitoring*, Vol 8, No. 6, 2006, pp. 630–633; 633. DOI 10.1039/b601526n.