



Standard Practice for Collection of Fungal Material From Surfaces by Tape Lift¹

This standard is issued under the fixed designation D7910; 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 describes the protocols for collection of surface samples using tape lifts and their delivery to the laboratory.

1.2 The purpose of this practice is to support the field investigator in differentiating fungal materials from non-fungal material such as scuffs, soot deposits, stains, pigments, dust, efflorescence, adhesives, and water stains.

1.3 The samples collected by this practice are appropriate for either qualitative or quantitative analysis by direct microscopy.

1.4 This practice does not address building occupant exposures, or occupant health risks.

1.5 This practice does not address the development of a formal hypothesis or the establishment of sampling objectives.

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

1.7 *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:*²

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

D4840 Guide for Sample Chain-of-Custody Procedures

D6044 Guide for Representative Sampling for Management of Waste and Contaminated Media

¹ This practice is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.08 on Sampling and Analysis of Mold.

Current edition approved June 1, 2014. Published July 2014. DOI: 10.1520/D7910-14.

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. Terminology

3.1 *Definitions*—For terminology not defined herein, refer to Terminology **D1356**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *area (surface, sampled), n*—a defined, measured extent of surface sampled.

3.2.2 *chain of custody (COC), n*—a document that provides for the traceable transfer of field samples to the analytical laboratory. It may or may not be combined with the field data sheet. **D4840**

3.2.3 *direct microscopy analysis, n*—act of assessing microorganisms (if present) using an optical compound microscope.

3.2.4 *field data sheet, n*—a record of varying names that provides a reference document for information directly related to the sample collection event, including pre- and post-calibration data.

3.2.5 *fungal material, n*—fungal spores, hyphae, and reproductive structures.

3.2.6 *fungal structure (sing.), n*—collective term for fragments or groups of fragments from fungi, including but not limited to conidia, conidiophores, hyphae and spores.

3.2.7 *fungi (pl.), n*—eukaryotic, heterotrophic, absorptive organisms that usually develop a rather diffuse, branched, tubular body (that is, network of hyphae) and usually reproduce by means of spores.³ The terms 'mold' and 'mildew' are frequently used by laypersons when referring to various fungal colonization.

3.2.8 *sample, n*—a portion of material that is taken for testing or record purposes. **D6044**

4. Significance and Use

4.1 This practice defines a consistent procedure for collecting surface material using clear, transparent, single sided adhesive collection medium, typically tape (also known as tape lift).

4.2 A tape lift sample collected according to this practice is intended to be used to assess the material present at one specific location on a surface for fungal content.

³ Kendrick, B., *The Fifth Kingdom*, Focus Publishing / R. Pullins & Co, 2008.

4.3 A tape lift sample collected from a point of interest can be used for qualitative analysis or to quantify fungal material per sample or per unit area. Note that the recovery efficiency of material from the surface sampled is unknown and a likely source of uncertainty for quantitative analyses.

4.4 A tape lift sample collected according to this practice can be analyzed by direct microscopy.

4.5 This practice may help supplement consistency in mold sampling during an indoor air quality investigation.

5. Materials and Supplies

5.1 Single-sided adhesive collection medium.

5.1.1 Must be clean, clear, transparent, and able to fit on a microscope slide.

5.1.2 Must be of reasonable optical quality and does not react negatively with stains used by the laboratory.

NOTE 1—Clear adhesive tape is commercially available in the form of dispensing rolls, strips on or not on microscope slides, or flexible sticky transparent microscope slides. Thick transparent tape, typically used for packing, is not recommended since it does not fit well on a microscope slide and it is more difficult for the laboratory to prepare for analysis than other types of adhesive tapes.

5.2 Microscope slide or other clean, smooth surface that will not compromise the sample (for the purposes of this practice will be referred to as “microscope slide”).

5.3 Microscope slide container, if necessary.

5.4 Permanent marking pen or labels for sample identification.

5.5 Chain of custody form (COC).

5.6 Field data sheet, if separate from the COC.

5.7 Transportation container.

6. Procedure

6.1 Document sample location and surface condition.

NOTE 2—Variables influencing the surface condition can impact collection efficiency of the tape lift. Variables include but are not restricted to temperature, amount of moisture, amount of debris, and surface texture. For example, less material typically adheres to the tape when surfaces are extremely wet, cold, or rough in texture.

6.2 Document type of adhesive tape or slide used for sampling.

NOTE 3—Composition of adhesive on tape varies by manufacturer and may impact collection efficiency.

6.3 For adhesive tape sampling, perform the following steps:

6.3.1 Remove and discard tape that has been exposed (many typical dispensers leave an area of tape exposed between the roll and the cutter edge).

6.3.2 Remove or dispense enough unexposed adhesive tape to take a surface sample. A tape strip 2.5 to 5.0 cm long is typically enough and can easily fit on a microscope slide.

NOTE 4—For ease of handling tape, form a tab at one end of the tape strip by folding the tape onto itself. The tab acts as a handle on the adhesive tape.

6.3.3 Hold adhesive tape strip at edge (tab) of one end.

NOTE 5—Ensure that tape adhesive surface does not make contact with anything except the area to be sampled.

6.3.4 Gently place the tape strip with the adhesive side down on the area to be sampled.

6.3.5 Gently apply steady pressure along the back side of the tape strip to ensure adhesive is making contact with the surface being sampled.

6.3.6 Remove the tape with a slow and steady force.

6.3.7 Place the tape with adhesive side down onto a clean microscope slide.

6.3.8 Label the microscope slide with a unique identifier.

6.3.9 Place the sample slide into a microscope slide container.

6.4 For adhesive flexible slide sampling, perform the following steps:

6.4.1 Remove unexposed slide from container.

6.4.2 Label the flexible slide with a unique identifier.

6.4.3 Peel off protective cover from adhesive area.

6.4.4 Gently press adhesive area to surface to be sampled.

6.4.5 Gently remove slide from the surface.

6.4.6 Place adhesive slide sample in container. Do not replace protective cover.

6.5 Complete a field data sheet in a physical or electronic format. At a minimum, the sample field data sheet shall contain:

6.5.1 Sampling date,

6.5.2 Project designation (for example, name or number),

6.5.3 Sample collector’s name(s),

6.5.4 Unique sample identifier,

6.5.5 Location of sample,

6.5.6 Sampled surface description, and

6.5.7 Surface area dimensions, if appropriate.

6.6 Submit samples for analysis with COC or analysis request form, or both. At a minimum, the COC shall include:

6.6.1 Name and signature of submitting person;

6.6.2 Date, time, and signature of releasing party;

6.6.3 Name and contact information of responsible party (that is, investigator’s employer);

6.6.4 Unique sample identifier(s);

6.6.5 Contact information for analytical report receipt, if different than submitter’s information;

6.6.6 Analysis requested; and

6.6.7 Turn-around time(s) requested.

6.7 Prepare samples for transport to the laboratory and submit to the laboratory as soon as practical following sampling.

6.7.1 All samples should be packaged to protect from damage and temperature extremes during transit.

6.7.2 Ship samples by way of a traceable carrier, if not hand delivered.

7. Keywords

7.1 fungal material; fungal particulate; fungi; fungus; indoor air quality; mold; mould; particulate; sampling; source sampling; spore; surface sampling; tape; tape lift

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