Designation: D7789 – 12 (Reapproved 2021)

Standard Practice for Collection of Fungal Material from Surfaces by Swab[1]

This standard is issued under the fixed designation D7789; 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 The purpose of this practice is to describe the procedures for collection of surface samples using sterile swabs.

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, dust, and water stains.

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

1.4 The samples collected by this practice are appropriate for culture, direct microscopy, and biochemical analysis, or combination thereof.

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

1.6 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

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

3. Terminology

3.1 *Definitions:*

3.1.1 *sample, n*—a portion of a population intended to be representative of the whole. a portion of a population. A portion of material that is taken for testing or record purposes. **D6044**

3.1.2 *sampling, n*—a process consisting of the withdrawal or isolation of a fractional part of the whole. **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 *biochemical analysis, n*—act of assessing chemical substances (that is, chitin, enzyme activity, ergosterol, mycotoxin, DNA) originating from living or dead organisms.

3.2.3 *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.

3.2.4 *culture analysis, n*—act of assessing microorganisms (if present) capable of growing on selected media under artificial and controlled conditions.

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

3.2.6 *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.

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

3.2.8 *fungi, n*—eukaryotic, heterotrophic, absorptive organisms that develop a rather diffuse, branched, tubular body (that is, network of hyphae) and reproduce by means of spores.[3] The terms 'mold' and 'mildew' are frequently used by laypersons when referring to various fungal colonization. For purposes of this practice, these terms have no technical meaning.

4. Significance and Use

4.1 This practice provides a procedure for collecting surface material using a sterile swab.

4.2 A swab sample collected according to this practice is intended to be used to assess fungal material on surfaces.

[1] This practice is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.08 on Assessment, Sampling, and Analysis of Microorganisms.

Current edition approved July 1, 2021. Published July 2021. Originally approved in 2012. Last previous edition approved in 2012 as D7789 – 12. DOI: 10.1520/D7789-12R21.

[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] Kendrick, B., *The Fifth Kingdom*, 3rd Edition, 1992.

4.3 A swab sample collected from an area with defined dimensions can be used to quantify fungal material per unit area or for qualitative analysis.

4.4 A swab sample collected from point(s) of interest can be used for qualitative analysis or to quantify fungal material per sample.

4.5 A swab sample collected according to this practice can be analyzed by direct microscopy, culture, or biochemical analysis.

5. Materials and Supplies

5.1 *Swabs:*

5.1.1 Must be sterile and have a sterile transport container.

5.1.2 May be used dry or wetted.

5.1.2.1 Wetting/transport media (not required for dry swabs) must be appropriate for the intended analysis.

5.2 *Ruler, template, or equivalent* for measuring sample area.

5.3 *Permanent marking pen or labels* for sample identification.

5.4 *Chain of custody (COC).*

5.5 *Field data sheet,* if separate from the COC.

5.6 *Temperature controlled transportation container,* as appropriate.

6. Procedure

6.1 Document sample location/surface.

6.2 Document the dimensions of the sampled area, if appropriate.

6.3 Select appropriate swab type (dry or wetted) to achieve optimum collection efficiency.

6.4 Remove swab from container and maintain sterility by taking care not to contact any surface, except the area to be sampled.

6.4.1 For a dimensional area sample, rub swab across sampling area in a back and forth motion, both horizontally and vertically, slightly turning the swab with each pass until entire area is sampled and the maximum material has been collected from the surface.

6.4.2 For a point of interest sample, touch the swab to the surface.

6.5 Return swab to sterile container for transport.

6.6 Label the sample container with a unique identifier.

6.7 Complete field data sheet in a physical or electronic format.

6.7.1 At a minimum, the sample field data sheet shall contain the following information:

6.7.1.1 Sampling date;

6.7.1.2 Project name;

6.7.1.3 Investigator's name(s);

6.7.1.4 Unique sample identifier;

6.7.1.5 Location of sample within structure; and

6.7.1.6 Surface area dimensions if appropriate.

6.8 Submit samples for analysis with COC, or analysis request form, or both.

6.8.1 At a minimum include:

6.8.1.1 Name and signature of investigator;

6.8.1.2 Date, time and signature of releasing party;

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

6.8.1.4 List unique sample identifier(s);

6.8.1.5 Contact information for analytical report receipt, if different than submitter's information;

6.8.1.6 Specify analytical method(s);

6.8.1.7 Turn-around time(s) requested.

NOTE 1—Appendix X1 provides an example of the combined field data sheet and COC.

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

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

6.8.2.2 Package wet samples for culture or direct microscopic analysis with an ice pack (or similar) in an insulated container to stabilize the sample during shipping.

6.8.2.3 Package samples for biochemical analysis as appropriate for analysis.

6.8.2.4 Ship samples by means of a traceable carrier, if not hand delivered.

7. Interferences and Limitations

7.1 The collection efficiency is a function of the texture of the surface sampled, the loading of the swab and whether the swab is dry or wetted.

7.2 Not all types of fungal material are retained to the same degree by the swab.

7.3 This practice does not distinguish between the collection efficiency of dry and wetted swabs.

7.4 Swabs may lose material in the transport container.

8. Keywords

8.1 biochemical; culture; fungi; mold; mould; microscopy; particulate; surface sampling; swab

APPENDIX

(Nonmandatory Information)

X1. EXAMPLE FIELD DATA SHEET/CHAIN-OF-CUSTODY

X1.1 See Fig. X1.1.

Field Data Sheet & Chain of Custody						
Contact:		**Project:**		**Notes:**		
Client:		Site Info:				
Address:						
Address:		Investigator/Sampler:				
Phone:		Date Sampled:		Date Submitted:		
Sample Location Information		Collection Information				
Field Sample #	Location Description	Notes	Date/Time	Media	Surface Area	Laboratory Request
Tracking	Released By: (Signature)	Date/Time	Received at Lab By:			Date/Time

FIG. X1.1 Example Field Data Sheet/Chain-of-Custody