



Designation: D3686 – 20

Standard Practice for Sampling Atmospheres to Collect Organic Compound Vapors (Activated Charcoal Tube Adsorption Method)¹

This standard is issued under the fixed designation D3686; 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 a method for the sampling of atmospheres to determine the presence of certain organic vapors by means of adsorption on activated charcoal using a charcoal tube and a small portable sampling pump worn by a worker. A list of some of the organic chemical vapors that can be sampled by this practice is provided in **Annex A1**. This list is presented as an information guide and should not be considered as absolute or complete.

1.2 This practice does not cover any method of sampling that requires special impregnation of activated charcoal or other adsorption media.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use. A specific safety precaution is given in 9.4.*

1.5 *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

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 March 1, 2020. Published June 2020. Originally approved in 1978. Last previous edition approved in 2013 as D3686 – 13. DOI: 10.1520/D3686-20.

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.

D3687 Test Method for Analysis of Organic Compound Vapors Collected by the Activated Charcoal Tube Adsorption Method

D4840 Guide for Sample Chain-of-Custody Procedures

D5337 Practice for Flow Rate Adjustment of Personal Sampling Pumps

2.2 NIOSH Standards:

CDC-99-74-45 Documentation of NIOSH Validation Tests³

HSM-99-71-31 Personal Sampler Pump for Charcoal Tubes; Final Report³

NIOSH Manual of Analytical Methods⁴

2.3 OSHA Standards:

29 CFR 1910 U.S. Code of Federal Regulations Relating to Labor, U.S. Occupational Safety and Health Administration, Department of Labor⁵

OSHA Chemical Sampling Information⁶

OSHA Sampling and Analytical Methods⁷

2.4 Other Documents:

ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories⁸

3. Terminology

3.1 **Definitions**—For definitions of terms used in this method, refer to Terminology **D1356**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 **activated charcoal, n**—charcoal that has been heated or otherwise treated to increase its adsorptive power.

3.2.1.1 **Discussion**—A common procedure is to increase the inherent porosity of charcoal derived from biological precursors (for example, nut shells) by steam activation. Prior to use

³ Available from National Technical Information Service (NTIS), 5285 Port Royal Rd., Springfield, VA 22161, <http://www.ntis.gov>.

⁴ NIOSH Manual of Analytical Methods, <http://www.cdc.gov/niosh/nmam>.

⁵ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

⁶ OSHA Chemical Sampling Information, http://osha.gov/dts/chemicalsampling/toc/toc_chemsamp.html.

⁷ OSHA Sampling and Analytical Methods, <http://osha.gov/dts/sltc/methods/toc.html>.

⁸ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.