



Designation: D5149 – 24

Standard Test Method for Ozone in the Atmosphere: Continuous Measurement by Ethylene Chemiluminescence¹

This standard is issued under the fixed designation D5149; 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 test method describes the sampling and continuous analysis of the ozone content of the atmosphere at concentrations of 20 μg to 2000 μg of ozone/ m^3 (10 ppb (v) to 1 ppm (v)).

1.2 This test method is limited in application by its sensitivity to interferences as described below. This test method is not suitable for personal sampling because of instrument size and sensitivity to vibration and ambient temperature.

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.* Some specific precautionary statements are presented in Section 8.

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

D1357 Practice for Planning the Sampling of the Ambient Atmosphere

¹ This test method is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.03.02 on Ambient Atmospheres, Fenceline and Special Monitoring.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

D1914 Practice for Conversion Units and Factors Relating to Sampling and Analysis of Atmospheres

D3249 Practice for General Ambient Air Analyzer Procedures

D3670 Guide for Determination of Precision and Bias of Methods of Committee D22

D5011 Practices for Calibration of Ozone Monitors Using Transfer Standards

D5110 Practice for Calibration of Ozone Monitors and Certification of Ozone Transfer Standards Using Ultraviolet Photometry

IEEE/ASTM SI-10 Practice for Use of the International System of Units (SI) (the Modernized Metric System)

2.2 *U.S. Environmental Protection Agency Standards:*³

EPA-600/4-79-056 Transfer Standards for Calibration of Air Monitoring Analyzers for Ozone (NTIS: PB80146871)

EPA-600/4-79-057 Technical Assistance Document for the Calibration of Ozone Monitors (NTIS: PB80149552)

EPA-600/4-80-050 Evaluation of Ozone Calibration Techniques (NTIS: PB81118911)

EPA-600/4-83-003 Performance Test Results and Comparative Data for Designated Reference and Equivalent Methods for Ozone (NTIS: PB83166686)

2.3 *Code of Federal Regulations:*³

40 CFR Part 53.20 Ambient Air Monitoring Reference and Equivalent Methods: General provisions

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology **D1356** and Practice **D1914**. An explanation of units, symbols and conversion factors may be found in Practice **IEEE/ASTM SI-10**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *absolute ultra-violet photometer, n*—a photometer whose design, construction and maintenance is such that it can measure the absorbance caused by ozone mixtures without reference to external absorption standards.

3.2.1.1 *Discussion*—Given a value for the absorption coefficient of ozone at 253.7 nm and a reading from the absolute

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