



Standard Practices for Calibration of Ozone Monitors Using Transfer Standards¹

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1. Scope

1.1 These practices describe means for calibrating ambient, workplace or indoor ozone monitors, using transfer standards.

1.2 These practices describe five types of transfer standards:

(A) Analytical instruments

(B) Boric acid potassium iodide (BAKI) manual analytical procedure

(C) Gas phase titration with excess nitric oxide

(D) Gas phase titration with excess ozone

(E) Ozone generator device.

1.3 These practices describe procedures to establish the authority of transfer standards: qualification, certification, and periodic recertification.

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 and health practices and determine the applicability of regulatory limitations prior to use.* See Section 8 for specific precautionary statements.

2. Referenced Documents

2.1 *ASTM Standards:*

D 1071 Test Methods for Volumetric Measurement of Gaseous Fuel Samples²

D 1193 Specification for Reagent Water³

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres⁴

D 3195 Practice for Rotameter Calibration⁴

D 3249 Practice for General Ambient Air Analyzer Procedures⁴

D 3631 Test Methods for Measuring Surface Atmospheric Pressure⁴

D 5110 Practice for Calibration of Ozone Monitors and Certification of Ozone Transfer Standards Using Ultraviolet Photometry⁴

E 591 Practice for Safety and Health Requirements Relating

to Occupational Exposure to Ozone⁵

2.2 *Other Documents:*

40 CFR Part 50, Environmental Protection Agency Regulations on Ambient Air Monitoring Reference Methods⁶

3. Terminology

3.1 For definitions of terms used in this standard, see Terminology D 1356.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *primary standard*—a standard directly defined and established by some authority, against which all secondary standards are compared.

3.2.2 *secondary standard*—a standard used as a means of comparison, but checked against a primary standard.

3.2.3 *standard*—an accepted reference sample or device used for establishing measurement of a physical quantity.

3.2.4 *transfer standard*—a type of secondary standard. It is a transportable device or apparatus, which, together with operational procedures, is capable of reproducing pollutant concentration or producing acceptable assays of pollutant concentrations.

3.2.5 *zero air*—purified air that does not contain ozone and does not contain any other component that may interfere with the measurement. See 7.1.

3.3 *Symbols:*

b = Spectrophotometer cell path length, cm. See Annex A2.

d_{avg} = Average of discrete single point comparisons. See Annex A1.

d_i = Single point comparison. See Annex A1.

F_D = Diluent air flow, mL/min.

F_D' = New diluent air flow, mL/min.

F_{NO} = NO flow, mL/min.

F_O = Flow through the O₃ generator, mL/min.

F_R = Flowrate corrected to reference conditions (25°C and 101.3 kPa), mL/min. See Annex A2.

F_S = Flowrate at sampling conditions, mL/min. See Annex A2.

¹ These practices are under the jurisdiction of ASTM Committee D22 on Sampling and Analysis of Atmospheres and are the direct responsibility of Subcommittee D22.03 on Ambient Atmospheres and Source Emissions.

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² *Annual Book of ASTM Standards*, Vol 05.05.

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ *Annual Book of ASTM Standards*, Vol 11.03.

⁵ Discontinued; see 1990 *Annual Book of ASTM Standards*, Vol 11.03.

⁶ Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.