



Designation: D8230 – 19

# Standard Test Method for Measurement of Volatile Silicon-Containing Compounds in a Gaseous Fuel Sample Using Gas Chromatography with Spectroscopic Detection<sup>1</sup>

This standard is issued under the fixed designation D8230; 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 is primarily for gas-phase siloxane compounds present in biogas and other gaseous fuel samples at ppmv and high ppbv concentrations. It may also be applicable to low ppbv concentrations under certain circumstances.

1.2 *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.*

1.3 *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:*<sup>2</sup>

**D4150 Terminology Relating to Gaseous Fuels**

2.2 *Government Documents:*

**Compendium Method TO-15 Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)**<sup>3</sup>

**NIOSH Manual of Analytical Methods (NMAM) - 4th Edition Development and Evaluation of Methods**<sup>4</sup>

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D03 on Gaseous Fuels and is the direct responsibility of Subcommittee D03.05 on Determination of Special Constituents of Gaseous Fuels.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from U.S. Environmental Protection Agency, 109 T.W. Alexander Drive, Durham, NC 27709, <https://www.epa.gov>.

<sup>4</sup> Available from The National Institute for Occupational Safety and Health (NIOSH), <https://www.cdc.gov>.

## 3. Terminology

3.1 *Definitions*—For definitions of general gaseous fuel terms used in this test method, refer to Terminology **D4150**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *analytical sequence, n*—describes how and the order that field and QC samples in an analytical batch are analyzed.

3.2.2 *calibration standard (ICAL), n*—a mixture of an analyte at a known concentration prepared from a primary stock.

3.2.2.1 *Discussion*—A calibration standard is analyzed at varying concentrations and used to calibrate the response of the measurement system with respect to analyte concentration.

3.2.3 *Continuing Calibration Verification (CCV) Standard, n*—a solution (or set of solutions) of known analyte concentration used to verify freedom from excessive instrumental drift; the concentration is to be near the mid-range of a linear calibration curve.

3.2.4 *gas phase sample, n*—a direct-injection sample that has been collected in a device such as a summa canister or Tedlar bag.

3.2.5 *Initial (or Independent) Calibration Verification (ICV) Standard, n*—a solution (or set of solutions) of known analyte concentration used to verify calibration standard levels; the concentration of analyte is to be near the mid-range of the calibration curve that is made from a stock solution having a different manufacturer or manufacturer lot identification than the calibration standards.

3.2.6 *integration filter, n*—a mathematical operation performed on an absorbance spectrum for the purpose of converting the spectrum to a single-valued response suitable for representation in a two-dimensional chromatogram plot.

3.2.7 *internal standard, n*—a non-analyte element, present in all calibration, blank, and sample solutions, the signal from which is used to correct for non-spectral interference or improve analytical precision.

3.2.8 *laboratory control sample (LCS), n*—a laboratory control sample is an analyte-free matrix to which a known quantity of analyte is added.

3.2.8.1 *Discussion*—The LCS is subjected to the same