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.

Designation: D5599 – 17

Standard Test Method for Determination of Oxygenates in Gasoline by Gas Chromatography and Oxygen Selective Flame Ionization Detection[1]

This standard is issued under the fixed designation D5599; 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 covers a gas chromatographic procedure for the quantitative determination of organic oxygenated compounds in gasoline having a final boiling point not greater than 220 °C and oxygenates having a boiling point limit of 130 °C. It is applicable when oxygenates are present in the 0.1 % to 20 % by mass range.

1.2 This test method is intended to determine the mass concentration of each *oxygenate compound* present in a gasoline. This requires knowledge of the identity of each oxygenate being determined (for calibration purposes). However, the oxygen-selective detector used in this test method exhibits a response that is proportional to the mass of *oxygen*. It is, therefore, possible to determine the mass concentration of *oxygen* contributed by any oxygenate compound in the sample, whether or not it is identified. Total oxygen content in a gasoline may be determined from the summation of the accurately determined individual oxygenated compounds. The summed area of other, uncalibrated or unknown oxygenated compounds present, may be converted to a mass concentration of oxygen and summed with the oxygen concentration of the known oxygenated compounds.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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 and health practices and determine the applicability of regulatory limitations prior to use.*

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]

D1298 Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method

D1744 Test Method for Determination of Water in Liquid Petroleum Products by Karl Fischer Reagent (Withdrawn 2016)[3]

D4052 Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

D4307 Practice for Preparation of Liquid Blends for Use as Analytical Standards

E594 Practice for Testing Flame Ionization Detectors Used in Gas or Supercritical Fluid Chromatography

E1064 Test Method for Water in Organic Liquids by Coulometric Karl Fischer Titration

E1510 Practice for Installing Fused Silica Open Tubular Capillary Columns in Gas Chromatographs

3. Terminology

3.1 *Definitions:*

3.1.1 *independent reference standards, n*—calibration samples of the oxygenates which are purchased or prepared from materials independent of the quality control check standards and used for intralaboratory accuracy.

3.1.2 *oxygenate, n*—an oxygen-containing compound, such as an alcohol or ether, which may be used as a fuel or fuel supplement.

[1] This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.04.0L on Gas Chromatography Methods.

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[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] The last approved version of this historical standard is referenced on www.astm.org.

*A Summary of Changes section appears at the end of this standard

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