



Designation: D7059 – 21

Standard Test Method for Determination of Methanol in Crude Oils by Multidimensional Gas Chromatography¹

This standard is issued under the fixed designation D7059; 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 the determination of methanol in crude oils by direct injection multidimensional gas chromatography in the concentration range of 15 ppm (m/m) to 900 ppm (m/m). The pooled limit of quantification (PLOQ) is 15 ppm (m/m).

1.2 This test method is applicable only to crude oils containing less than or equal to 0.1 % (v/v) water.

1.3 This test method has not been tested with crude oil samples that are solid or waxy, or both, at ambient temperatures.

1.4 The values stated in SI units are to be regarded as standard. Alternate units, in common usage, are also provided to increase clarity and aid the users of this test method.

1.5 *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.*

1.6 *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

D4006 Test Method for Water in Crude Oil by Distillation
D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

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 D02.04.01 on Gas Chromatography Methods.

Current edition approved Dec. 1, 2021. Published December 2021. Originally approved in 2004. Last previous edition approved in 2017 as D7059 – 09 (2017). DOI: 10.1520/D7059-21.

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.

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants
D4307 Practice for Preparation of Liquid Blends for Use as Analytical Standards
D4928 Test Method for Water in Crude Oils by Coulometric Karl Fischer Titration
D6596 Practice for Ampulization and Storage of Gasoline and Related Hydrocarbon Materials
E355 Practice for Gas Chromatography Terms and Relationships
E594 Practice for Testing Flame Ionization Detectors Used in Gas or Supercritical Fluid Chromatography

3. Terminology

3.1 Definitions:

3.1.1 This test method makes reference to common gas chromatographic procedures, terms, and relationships. Detailed definitions of these can be found in Practices E355 and E594, and Terminology D4175. Additional definitions and information pertinent to this test method are listed below.

3.1.2 *analytical column, n*—porous layer open tubular (PLOT) column with a stationary phase selective for oxygenates; it is used to resolve methanol from 1-propanol to provide accurate quantitative results.

3.1.3 *cool-on-column injector, n*—an injection port that allows controlled injection of the sample at a temperature close to or lower than the boiling point of the solvent into the gas chromatographic column or a liner within the injection port connected to the column.

3.1.3.1 *Discussion*—After the injection, the injection port is heated at a fixed rate to a temperature sufficiently high enough to allow the transfer of sample components of interest from the injection port to the part of the column located in the gas chromatograph (GC) oven.

3.1.4 *electronic pressure control, n*—electronic pneumatic control of carrier gas flows; it can be flow or pressure programmed to speed up elution of components.

3.1.5 *low-volume connector, n*—a special union for connecting two lengths of tubing 1.6 mm inside diameter and smaller; sometimes referred to as a zero dead-volume union.

3.1.6 *pre-column, n*—a polydimethylsiloxane WCOT column used to isolate the methanol and 1-propanol and several

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