



Designation: D8274 – 19

Standard Test Method for Determination of Biodiesel (Fatty Acid Methyl Esters) Content in Diesel Fuel Oil by Portable Rapid Mid-Infrared Analyzer¹

This standard is issued under the fixed designation D8274; 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 the content of biodiesel (fatty acid methyl esters (FAME)) in diesel fuel oils for volume fractions of 0.1 % to 31.0 % by mid-infrared analyzer with a resolution of 0.1 %.

NOTE 1—ASTM and ISO specification fuels falling within the scope of this test method include Specifications: **D975** grades No. 1D and No. 2D, **D7467**, distillate grades of **D396**, MIL-DTL-16884, and distillate grades of marine fuel specification ISO 8217.

1.2 The accuracy of this test method is based on the molecular weight of C16 and C18 FAME species.

1.2.1 *Discussion*—Biodiesel contains a variety of species with different molecular weights. Typical market FAMES from North America and Europe, which are predominantly soy, rapeseed, and used cooking oil derived FAME were included in the pilot study. FAME derived from coconut, which predominantly contains C12, will over-read by approximately 30 %.

1.3 It is not possible to distinguish between vegetable oils, animal fats, FAEE, and FAME. For more information, see Section 6.

1.4 This test method has interim repeatability precision only, see Section 14 for more information.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *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.*

1.7 *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 Recom-*

mendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 ASTM Standards:²

- D86** Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure
- D396** Specification for Fuel Oils
- D445** Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
- D975** Specification for Diesel Fuel Oils
- D1298** Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
- D4052** Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter
- D4057** Practice for Manual Sampling of Petroleum and Petroleum Products
- D4175** Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants
- D4177** Practice for Automatic Sampling of Petroleum and Petroleum Products
- D4307** Practice for Preparation of Liquid Blends for Use as Analytical Standards
- D6299** Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance
- D6300** Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products and Lubricants
- D6751** Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels
- D7371** Test Method for Determination of Biodiesel (Fatty Acid Methyl Esters) Content in Diesel Fuel Oil Using Mid Infrared Spectroscopy (FTIR-ATR-PLS Method)

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 **D02.04.0F** on Absorption Spectroscopic 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.