



Designation: D8368 – 21

Standard Test Method for Determination of Totals of Saturate, Aromatic, Polyaromatic and Fatty Acid Methyl Esters (FAME) Content of Diesel Fuel Using Gas Chromatography with Vacuum Ultraviolet Absorption Spectroscopy Detection (GC-VUV)¹

This standard is issued under the fixed designation D8368; 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 standard procedure for the determination of group type totals of saturate, aromatic, polyaromatic, and FAME content in diesel fuel using gas chromatography and vacuum ultraviolet absorption spectroscopy detection (GC-VUV).

1.1.1 Polyaromatic totals are the result of the summation of diaromatic and tri-plus aromatic group types. Aromatics are the summation of monoaromatic and polyaromatic group types. FAME content is the result of summation of individual fatty acid methyl esters.

1.2 Concentrations of group type totals are determined by percent mass or percent volume. The applicable ranges are as follows:

Group Type	Applicable % Volume Range	Applicable % Mass Range
Saturate	64 to 99.5	60 to 99.3
Aromatic	0.5 to 36	0.7 to 40
Monoaromatic	0.5 to 36	0.7 to 40
Diaromatic	0.03 to 9	0.05 to 11
Tri+ aromatic	0.03 to 1	0.03 to 1.5
Polyaromatic	0.03 to 10	0.05 to 12.5
FAME	2 to 20	2 to 23

NOTE 1—Applicable ranges of components and precision will ultimately be defined by an interlaboratory study.

1.3 Diesel fuel containing biodiesel, (FAME, that is, fatty acid methyl esters) can be analyzed by this test method. The FAME component completely elutes from the analytical column independent of feedstock; however, interim precision is determined only with soy methyl esters. FAME content in diesel fuel can be determined by Test Methods [D7371](#) or [D7861](#).

1.4 Individual hydrocarbon components are not reported by this test method; however, any individual component determi-

nations are included in the appropriate summation of the totals of saturate, aromatic, polyaromatic, monoaromatic, diaromatic, tri-plus aromatic, or FAME groups.

1.4.1 Individual components are typically not baseline-separated by the procedure described in this test method, that is, some components will coelute. The coelutions are resolved at the detector using VUV absorbance spectra and deconvolution algorithms.

1.5 This test method has been tested for diesel fuel, including renewable diesel fuels from hydrotreated vegetable oil (HVO) and gas to liquid (GTL) processes, and biodiesel blends; this test method may apply to other hydrocarbon streams boiling between heptane (98 °C) and triacontane (450 °C), but has not been extensively tested for such applications.

1.6 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.7 *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.*

1.8 *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

[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.

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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.