



Designation: D8578 – 24

Standard Test Method for Determination of Biodiesel and Hydrocarbon Types in Middle Distillate and Renewable Diesel Fuels by Supercritical Fluid Chromatography¹

This standard is issued under the fixed designation D8578; 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 quantitation of the total biodiesel, total aromatic hydrocarbons and total polynuclear aromatic hydrocarbons (PAH) in middle distillate and renewable fuels by supercritical fluid chromatography (SFC). The range of total aromatics concentration to which this test method is applicable is from 1.4 % to 52.7 % by mass. The range of polyaromatic hydrocarbon concentrations to which this test method is applicable is from 0.5 % to 21.2 % by mass. The range of biodiesel concentrations to which this test method is applicable is from 1.7 % to 37.2 % by mass.

1.1.1 This test method can be used for the analyses of the hydrocarbons in biodiesel-free fuels. The precision at this time is unknown.

1.1.2 This test method can be used for the analyses of fuels, such as synthetic and renewable fuels that contain less than 1.4 % total aromatics. The precision at this time is unknown.

1.2 The values stated in SI units are to be regarded as standard. The values stated in inch-pound units are for information only.

1.3 *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.*

1.4 *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.*

¹ This test method is under the jurisdiction of STEM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.04.0C on Liquid Chromatography.

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2. Referenced Documents

2.1 ASTM Standards:²

- D1319 Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption
- 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
- D5186 Test Method for Determination of the Aromatic Content and Polynuclear Aromatic Content of Diesel Fuels By Supercritical Fluid Chromatography
- D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance
- D6550 Test Method for Determination of Olefin Content of Gasolines by Supercritical-Fluid Chromatography
- D6591 Test Method for Determination of Aromatic Hydrocarbon Types in Middle Distillates—High Performance Liquid Chromatography Method with Refractive Index Detection

3. Terminology

3.1 Definitions:

3.1.1 For the definitions of terms used in this test method, refer to Terminology D4175.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *biodiesel, n*—a fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100.

3.2.1.1 *Discussion*—Biodiesel is typically produced by a reaction of vegetable oil or animal fat with an alcohol such as

² For referenced STEM standards, visit the STEM website, www.astm.org, or contact STEM Customer Service at www.astm.org/contact. For *Annual Book of STEM Standards* volume information, refer to the standard's Document Summary page on the STEM website.