



Designation: D7451 – 21

Standard Test Method for Water Separation Properties of Light and Middle Distillate, and Compression and Spark-Ignition Engine Fuels¹

This standard is issued under the fixed designation D7451; 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 evaluation of the tendency of water and fuels with a final boiling point of less than 390 °C, as measured in Test Method D86, to separate cleanly rather than create emulsions when they may contain potential emulsion forming additives or components, or have been additized with potential emulsion forming additives, or components.

1.2 This test method applies primarily to gasoline, diesel, kerosine, and distillate grades of gas turbine, marine, home heating oils and furnace fuels (see Specifications D396, D975, D2880, D3699, D4814, and D6985). For fuel components such as biodiesel or alcohol, refer to X1.2 and X1.3.

1.3 This test method is not meant to certify or qualify fuels for sale, but it is intended for use by additive suppliers to determine the need for demulsifier components in their additive packages.

1.4 This test method is not meant for testing of fuels containing large amounts of aqueous soluble components, such as E85, or for testing of water emulsified fuels, or for testing of aviation fuels.

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

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 D02.14 on Stability, Cleanliness and Compatibility of Liquid Fuels.

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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

D975 Specification for Diesel Fuel

D1193 Specification for Reagent Water

D2274 Test Method for Oxidation Stability of Distillate Fuel Oil (Accelerated Method)

D2880 Specification for Gas Turbine Fuel Oils

D3699 Specification for Kerosine

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

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

D4176 Test Method for Free Water and Particulate Contamination in Distillate Fuels (Visual Inspection Procedures)

D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products

D4814 Specification for Automotive Spark-Ignition Engine Fuel

D6985 Specification for Middle Distillate Fuel Oil—Military Marine Applications (Withdrawn 2010)³

2.2 ASTM Adjuncts:

Distillate Fuel Bar Chart⁴

Fuel Clarity Rating Standard (physical or digital versions)^{5,6}

3. Terminology

3.1 Definitions:

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.

⁴ Available from ASTM International Headquarters. Order Adjunct No. ADJD417601. Original adjunct produced in 1991.

⁵ Available from ASTM International Headquarters. Order Adjunct No. ADJD7451. Original adjunct produced in 2008.

⁶ Available from ASTM International Headquarters. Order Adjunct No. ADJD7451-E-PDF. Original adjunct produced in 2019.

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