



Designation: D8181 – 19

Standard Specification for Microemulsion Blendstock for Preparing Microemulsion Test Fuel Oils¹

This standard is issued under the fixed designation D8181; 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 specification describes an alcohol-carboxylic acid blend, referred to as the microemulsion blendstock.

1.1.1 **Warning**—The microemulsion blendstock should be stored in facilities and equipment designed for oxygenated and low flashpoint liquids.

1.2 The microemulsion blendstock is to be blended with fuel oils to produce a microemulsion test fuel oil that consists of inverse micelles.

NOTE 1—While no fuel standard currently exists for a microemulsion test fuel oil, work to develop one is underway.

NOTE 2—Typical fuel oils that could be used for blending with microemulsion blendstock are fuels that comply with Specifications **D975** and **D396** and may contain up to 5 % by volume biodiesel.

NOTE 3—Testing with test fuels containing 10 % microemulsion blendstock using B5 as a base fuel did not show any detrimental changes to specified fuel properties relative to B0 base fuels, but can impair measurement of microemulsion blendstock concentration.

1.2.1 The microemulsion test fuel oil (to be made from this blendstock) is to be used for testing and demonstration purposes only in specific equipment and vehicles that are suited for or have been equipped with safety precautions for use with low flashpoint fuels and oxygenated fuels such as ethanol. Minimum safety precautions may include flame arrestors and grounding straps.

NOTE 4—The low flash point of this blendstock relative to conventional diesel fuel increases certain hazards during storage and distribution.

1.3 Nothing in this specification shall preclude observance of federal, state, or local regulations, which may be more restrictive.

1.4 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

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

- D97** Test Method for Pour Point of Petroleum Products
- D130** Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test
- D396** Specification for Fuel Oils
- D445** Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
- D664** Test Method for Acid Number of Petroleum Products by Potentiometric Titration
- D665** Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water
- D974** Test Method for Acid and Base Number by Color-Indicator Titration
- D975** Specification for Diesel Fuel Oils
- D3242** Test Method for Acidity in Aviation Turbine Fuel
- D4057** Practice for Manual Sampling of Petroleum and Petroleum Products
- D4175** Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants
- D4625** Test Method for Middle Distillate Fuel Storage Stability at 43 °C (110 °F)
- D4806** Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel
- D6584** Test Method for Determination of Total Monoglycerides, Total Diglycerides, Total Triglycerides,

¹ This specification is under the jurisdiction of ASTM Committee **D02** on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee **D02.E0** on Burner, Diesel, Non-Aviation Gas Turbine, and Marine Fuels.

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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.

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