Designation: ~~D8049 – 19~~ D8049 – 19a

Standard Test Method for Determining Concentration, Count, and Size Distribution of Solid Particles and Water in Light and Middle Distillate Fuels by Direct Imaging Analyzer[1]

This standard is issued under the fixed designation D8049; 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 uses a direct imaging analyzer to count and measure the size and shape of dispersed solid particles and water droplets in light and middle distillate fuels in the overall range from 4 µm to 100 µm and in size bands of ≥4 µm, ≥6 µm, and ≥14 µm.

NOTE 1—Particle size data from 0.7 µm through 300 µm is available for use or reporting if deemed helpful.

NOTE 2—Shape is used to classify particles, droplets, and bubbles and is not a reporting requirement.

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

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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D2276 Test Method for Particulate Contaminant in Aviation Fuel by Line Sampling

D3240 Test Method for Undissolved Water In Aviation Turbine Fuels

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

D4306 Practice for Aviation Fuel Sample Containers for Tests Affected by Trace Contamination

F658 Practice for Calibration of a Liquid-Borne Particle Counter Using an Optical System Based Upon Light Extinction (Withdrawn 2007)[3]

2.2 *ISO Standard:*[4]

ISO 12103-1 Road Vehicles—Test Contaminants for Filter Evaluation—Part 1: Arizona Test Dust

ISO 11171 Hydraulic Fluid Power—Calibration of Automatic Particle Counters for Liquids

2.3 *MIL Standard:*[5]

MIL-PRF-5606 Hydraulic Fluid, Petroleum Base; Aircraft, Missile and Ordinance

3. Terminology

3.1 For definitions of terms used in this standard, refer to Terminology D4175.

3.2 *Definitions of Terms Specific to This Standard:*

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[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] 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 American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[5] For referenced MIL standards, visit the Defense Logistics Agency, Document Services website at http://quicksearch.dla.mil

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

3.2.1 *air bubble, n*—non-fuel, gaseous formations within the fuel, generally spherical in shape and visible as a heavy wall ring due to the diffraction of light around and through them.

3.2.2 *droplet, n*—non-fuel liquid formations within the fuel, generally spherical in shape and visible as a thin wall ring due to the diffraction of light around and through them.

3.2.3 *major particle diameter µm, n*—the maximum two-dimensional length of the particle measured.

3.2.4 *minor particle diameter µm, n*—the maximum two-dimensional length of the particle measured perpendicular to the *major particle diameter*.

3.2.5 *particle, n*—non-liquid, non-gaseous, solid objects in the fuel.