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.

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Standard Test Methods for Electrical Conductivity of Aviation and Distillate Fuels[1]

This standard is issued under the fixed designation D2624; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 These test methods cover the determination of the electrical conductivity of aviation and distillate fuels with and without a static dissipator additive. The test methods normally give a measurement of the conductivity when the fuel is uncharged, that is, electrically at rest (known as the rest conductivity).

1.2 Two test methods are available for field tests of fuel conductivity. These are: (*1*) portable meters for the direct measurement in tanks or the field or laboratory measurement of fuel samples, and (*2*) in-line meters for the continuous measurement of fuel conductivities in a fuel distribution system. In using portable meters, care must be taken in allowing the relaxation of residual electrical charges before measurement and in preventing fuel contamination.

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

1.4 *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.* For specific precautionary statements, see 7.1, 7.1.1, and 11.2.1.

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2. Referenced Documents

2.1 *ASTM Standards:*[2]

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

D4308 Test Method for Electrical Conductivity of Liquid Hydrocarbons by Precision Meter

3. Terminology

3.1 *Definitions:*

3.1.1 *picosiemens per metre, n*—the unit of electrical conductivity is also called a conductivity unit (CU). A siemen is the SI definition of reciprocal ohm sometimes called mho.

$$1\ \text{pS/m} = 1 \times 10^{-12}\ \Omega^{-1}\ \text{m}^{-1} = 1\ \text{cu} = 1\ \text{picomho/m} \quad (1)$$

3.1.2 *rest conductivity, n*—the reciprocal of the resistivity of uncharged fuel in the absence of ionic depletion or polarization.

3.1.2.1 *Discussion*—It is the electrical conductivity at the initial instant of current measurement after a dc voltage is impressed between electrodes, or a measure of the average current when an alternating current (ac) voltage is impressed.

4. Summary of Test Methods

4.1 A voltage is applied across two electrodes in the fuel and the resulting current expressed as a conductivity value. With portable meters, the current measurement is made almost instantaneously upon application of the voltage to avoid errors due to ion depletion. Ion depletion or polarization is eliminated in dynamic monitoring systems by continuous replacement of the sample in the measuring cell, or by the use of an alternating voltage. The procedure, with the correct selection of electrode size and current measurement apparatus, can be used to measure conductivities from 1 pS/m or greater. The commercially available equipment referred to in these methods covers a conductivity range up to 2000 pS/m with good precision (see Section 12).

[1] These test methods are under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and are the direct responsibility of Subcommittee D02.J0.04 on Additives and Electrical Properties.

In the IP, these test methods are under the jurisdiction of the Standardization Committee.

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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**

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