



Designation: D5006 – 24

Standard Test Method for Measurement of Fuel System Icing Inhibitors (Ether Type) in Aviation Fuels¹

This standard is issued under the fixed designation D5006; 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 This test method covers a technique for measuring the concentration of Diethylene Glycol Monomethyl Ether (DiEGME) in aviation fuels. A measured volume of fuel, extracted with a fixed ratio of water, is tested with a suitable refractometer to determine the concentration of fuel system icing inhibitor (FSII) in fuel. Precision estimates have been determined for the DiEGME additive using specific extraction ratios with a wide variety of fuel types. The extraction ratios are high enough that portable handheld refractometers can be used, but not so high as to sacrifice accuracy or linearity, or both, in the 0.01 % to 0.25 % by volume range of interest.

1.2 DiEGME is fully described in Specification **D4171** and in other specifications.

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 **WARNING**—Mercury has been designated by many regulatory agencies as a hazardous substance that can cause serious medical issues. Mercury, or its vapor, has been demonstrated to be hazardous to health and corrosive to materials. Use Caution when handling mercury and mercury-containing products. See the applicable product Safety Data Sheet (SDS) for additional information. The potential exists that selling mercury or mercury-containing products, or both, is prohibited by local or national law. Users must determine legality of sales in their location.

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 standard-*

ization 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

D4171 Specification for Fuel System Icing Inhibitors

E1 Specification for ASTM Liquid-in-Glass Thermometers

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E2251 Specification for Liquid-in-Glass ASTM Thermometers with Low-Hazard Precision Liquids

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *analog refractometer, n*—a traditional-style refractometer which visually projects a shadowline onto a scale etched into a glass reticle.

3.1.1.1 *Discussion*—The scale, which is magnified by an eyepiece, displays either a direct reading of DiEGME concentration, as is the case with the analog HB refractometer, or may display Brix units which must be converted into DiEGME concentration.

3.1.2 *Brix refractometer, n*—a refractometer which displays readings on the Brix scale.

3.1.3 *Brix scale, n*—an expression of the mathematical relationship between refractive index and the concentration by weight of pure sucrose in water.

3.1.4 *digital refractometer, n*—A refractometer which relies on a solid-state image sensor to measure the refractive index of a solution, convert the refractive index reading into a particular unit of measure (percent DiEGME), and outputs the results on a digital display.

3.2 *Acronyms:*

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.J0.04** on Additives and Electrical Properties.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. 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