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.

Designation: D7974 – 21

Standard Test Method for Determination of Farnesane, Saturated Hydrocarbons, and Hexahydrofarnesol Content of Synthesized Iso-Paraffins (SIP) Fuel for Blending with Jet Fuel by Gas Chromatography[1]

This standard is issued under the fixed designation D7974; 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 determination of farnesane (2,6,10-trimethyldodecane), saturated hydrocarbons, and hexahydrofarnesol content in synthesized iso-paraffins (SIP) fuel for blending with jet fuel by gas chromatography.

1.2 Farnesane is determined from 96 % to 99.9 % by mass. Sum of saturated hydrocarbons including farnesane is determined from 97 % to 99.9 % by mass, and hexahydrofarnesol is determined from 0.02 % to 2.0 % by mass.

1.3 This test method does identify and quantify main impurities or group type of impurities but does not purport to identify all individual components that can be present in synthesized iso-paraffins (SIP) fuel for jet fuel blending.

1.4 This test method is inappropriate for impurities that boil at temperatures higher than 460 °C or for impurities that cause poor or no response in a flame ionization detector.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

D4307 Practice for Preparation of Liquid Blends for Use as Analytical Standards

D7566 Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons

E355 Practice for Gas Chromatography Terms and Relationships

E594 Practice for Testing Flame Ionization Detectors Used in Gas or Supercritical Fluid Chromatography

3. Terminology

3.1 *Definitions:*

3.1.1 This test method makes reference to many common gas chromatographic procedures, terms, and relationships. Detailed definitions can be found in Practices E355 and E594.

3.1.2 *saturated hydrocarbons, n*—paraffinic and naphthenic compounds.

4. Summary of Test Method

4.1 A representative aliquot of the synthesized iso-paraffins (SIP) fuel sample is introduced into a gas chromatograph equipped with a 5 % phenyl-methylpolysiloxane bonded phase capillary column. Helium or hydrogen carrier gas transports the vaporized aliquot through the column where the components are separated by the chromatographic process. Components are sensed by a flame ionization detector as they elute from the column. The detector signal is processed by an electronic data acquisition system. The farnesane and its impurities are identified by comparing their relative retention times to the ones reported in the method. Identification has been previously performed analyzing reference samples by

[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 D02.04.0L on Gas Chromatography Methods.

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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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