



Designation: D7419 – 24

Standard Test Method for Determination of Total Aromatics and Total Saturates in Lube Basestocks by High Performance Liquid Chromatography (HPLC) with Refractive Index Detection¹

This standard is issued under the fixed designation D7419; 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 total aromatics and total saturates in additive-free lube basestocks using high performance liquid chromatography (HPLC) with refractive index (RI) detection. This test method is applicable to samples containing total saturates in the concentration range of 74.9 % to 100.0 % by mass and aromatics in the concentration range of 0.0 % to 25.1 % by mass. The precision is expressed in terms of the total saturates.

1.1.1 Polar compounds, if present, are combined with the total aromatics. Precision was determined for basestocks with polars content <1.0 % by mass.

1.2 This test method includes a relative bias section for total saturates in basestocks based on a Practice D6708 accuracy assessment between Test Method D7419 and Test Method D2007. The derived correlation equation is only applicable for basestocks in the total saturates concentration range from 75.0 % to 100.0 % by mass as measured by Test Method D7419.

1.2.1 The applicable range for total saturates by Test Method D2007 is from 71.0 % to 99.0 % by mass as reported by Test Method D2007.

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.*

1.5 *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

D2007 Test Method for Characteristic Groups in Rubber Extender and Processing Oils and Other Petroleum-Derived Oils by the Clay-Gel Absorption Chromatographic Method

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

D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance

D6300 Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products, Liquid Fuels, and Lubricants

D6708 Practice for Statistical Assessment and Improvement of Expected Agreement Between Two Test Methods that Purport to Measure the Same Property of a Material

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this test method, refer to Terminology D4175.

3.1.2 *aromatics, n—in high performance liquid chromatography*, aromatic hydrocarbon components, minus polar material, that have a longer retention time than saturates on the specified polar columns, but can be removed as a single peak by backflushing the columns with heptane.

3.1.2.1 *Discussion*—Generally, aromatic hydrocarbons contain one to four rings.

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 D02.04.0C on Liquid Chromatography.

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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