



Designation: D1218 – 21

Standard Test Method for Refractive Index and Refractive Dispersion of Hydrocarbon Liquids¹

This standard is issued under the fixed designation D1218; 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 the measurement of refractive index, accurate to four decimal places or better, of transparent and light-colored hydrocarbons in the range of 1.3300 to 1.5000 at temperatures from 20 °C to 30 °C by manual (optical-mechanical) or automatic (digital) procedure.

1.2 The manual (optical-mechanical) procedure also covers the measurement of refractive dispersion accurate to the fourth decimal place or better.

NOTE 1—The test method may be suitable for measuring the refractive indices of liquids above 1.5000 and at temperatures both below 20 °C and above 30 °C; however, the test method precision may not apply. Verification of the accuracy of such measurements will depend upon the availability of reliable, certified reference standards that demonstrate the performance of the instrument used under the particular measuring conditions.

1.3 The test method may not be applicable to liquids that are strongly colored, or that have bubble points so near the test temperature that a reading cannot be obtained before substantial weathering takes place. Liquid color should be limited to No. 4 ASTM Color or lighter, as determined by Test Method **D1500**.

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

1.5 **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 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 **D02.04.0D** on Physical and Chemical Methods.

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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

D1193 Specification for Reagent Water

D1500 Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)

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

E1 Specification for ASTM Liquid-in-Glass Thermometers

2.2 ASTM Adjuncts:

Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products and Lubricants, Version 4.0.65³

3. Terminology

3.1 Definitions:

3.1.1 *refractive dispersion, n* —the difference between the refractive indices of a substance for light of two different wavelengths, both indices being measured at the same temperature.

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 Out of print. No longer available from ASTM International Headquarters.

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