Designation: D1159 – 07

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Standard Test Method for Bromine Numbers of Petroleum Distillates and Commercial Aliphatic Olefins by Electrometric Titration[1]

This standard is issued under the fixed designation D1159; 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 Department of Defense.

1. Scope*

1.1 This test method[2] covers the determination of the bromine number of the following materials:

1.1.1 Petroleum distillates that are substantially free of material lighter than isobutane and that have 90 % distillation points (by Test Method D86) under 327°C (626°F). This test method is generally applicable to gasoline (including leaded, unleaded, and oxygenated fuels), kerosine, and distillates in the gas oil range that fall in the following limits:

90 % Distillation Point, °C (°F)	Bromine Number, max[2]
Under 205 (400)	175
205 to 327 (400 to 626)	10

1.1.2 Commercial olefins that are essentially mixtures of aliphatic mono-olefins and that fall within the range of 95 to 165 bromine number (see Note 1). This test method has been found suitable for such materials as commercial propylene trimer and tetramer, butene dimer, and mixed nonenes, octenes, and heptenes. This test method is not satisfactory for normal alpha-olefins.

NOTE 1—These limits are imposed since the precision of this test method has been determined only up to or within the range of these bromine numbers.

1.2 The magnitude of the bromine number is an indication of the quantity of bromine-reactive constituents, not an identification of constituents; therefore, its application as a measure of olefinic unsaturation should not be undertaken without the study given in Annex A1.

1.3 For petroleum hydrocarbon mixtures of bromine number less than 1.0, a more precise measure for bromine-reactive constituents can be obtained by using Test Method D2710. If the bromine number is less than 0.5, then Test Method D2710 or the comparable bromine index methods for industrial aromatic hydrocarbons, Test Methods D1492 or D5776 must be used in accordance with their respective scopes. The practice of using a factor of 1000 to convert bromine number to bromine index is not applicable for these lower values of bromine number.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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 and health practices and determine the applicability of regulatory limitations prior to use.* For specific warning statements, see Sections 7, 8, and 9.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

D86 Test Method for Distillation of Petroleum Products at Atmospheric Pressure

D1193 Specification for Reagent Water

D1492 Test Method for Bromine Index of Aromatic Hydrocarbons by Coulometric Titration

D2710 Test Method for Bromine Index of Petroleum Hydrocarbons by Electrometric Titration

D5776 Test Method for Bromine Index of Aromatic Hydrocarbons by Electrometric Titration

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *bromine number*—the number of grams of bromine that will react with 100 g of the specimen under the conditions of the test.

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[1] This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.04.0D on Physical and Chemical Methods.

In the IP, this test method is under the jurisdiction of the Standardization Committee.

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[2] See Dubois, H. D., and Skoog, D. A., "Determination of Bromine Addition Numbers," *Analytical Chemistry*, Vol 20, 1948, pp. 624–627.

[3] 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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