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: D1160 – 18

Standard Test Method for Distillation of Petroleum Products at Reduced Pressure[1]

This standard is issued under the fixed designation D1160; 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 determination, at reduced pressures, of the range of boiling points for petroleum products and biodiesel that can be partially or completely vaporized at a maximum liquid temperature of 400 °C. Both a manual method and an automatic method are specified.

1.2 In cases of dispute, the referee test method is the manual test method at a mutually agreed upon pressure.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered 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.* For specific warning statements, see 6.1.4, 6.1.8.1, 10.11, and A3.2.1.

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]

D613 Test Method for Cetane Number of Diesel Fuel Oil
D1193 Specification for Reagent Water
D1250 Guide for Use of the Petroleum Measurement Tables
D1298 Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
D4052 Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter
D4057 Practice for Manual Sampling of Petroleum and Petroleum Products
D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products
D6300 Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products and Lubricants

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *atmospheric equivalent temperature (AET), n*—the temperature converted from the measured vapor temperature using Eq A7.1. The AET is the expected distillate temperature if the distillation was performed at atmospheric pressure and there was no thermal decomposition.

3.1.2 *end point (EP) or final boiling point (FBP), n*—the maximum vapor temperature reached during the test.

3.1.3 *initial boiling point (IBP), n*—the vapor temperature that is measured at the instant the first drop of condensate falls from the lower end of the condenser section drip tip.

3.1.3.1 *Discussion*—When a chain is attached to the drip tip the first drop will form and run down the chain. In automatic apparatus, the first drop detection device shall be located as near to the lower end of the drip tip as practical.

3.1.4 *spillover point, n*—the highest point of the lower internal junction of the distillation column and the condensing section of the vacuum-jacketed column assembly.

4. Summary of Test Method

4.1 The sample is distilled at an accurately controlled pressure between 0.13 kPa and 6.7 kPa (1 mm and 50 mm Hg) under conditions that are designed to provide approximately one theoretical plate fractionation. Data are obtained from which the initial boiling point, the final boiling point, and a distillation curve relating volume percent distilled and atmospheric equivalent boiling point temperature can be prepared.

[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 D02.08 on Volatility.

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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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