Designation: D 1160 – 03

An American National Standard

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

This standard is issued under the fixed designation D 1160; 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 covers the determination, at reduced pressures, of the range of boiling points for petroleum products 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 the standard. The values in parentheses are for information only.

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 and health practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see 6.1.4, 6.1.8.1, 10.11, and A3.2.1.

2. Referenced Documents

2.1 *ASTM Standards:*

D 613 Test Method for Cetane Number of Diesel Fuel Oil[2]

D 1193 Specification for Reagent Water[3]

D 1250 Guide for Petroleum Measurement Tables[4]

D 1298 Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method[4]

D 4052 Test Method for Density and Relative Density of Liquids by Digital Density Meter[5]

D 4057 Practice for Manual Sampling of Petroleum and Petroleum Products[5]

D 4177 Practice for Automatic Sampling of Petroleum and Petroleum Products[5]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *atmospheric equivalent temperature (AET)*—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)*—the maximum vapor temperature reached during the test.

3.1.3 *initial boiling point (IBP)*—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*—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 and 6.7 kPa (1 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.

5. Significance and Use

5.1 This test method is used for the determination of the distillation characteristics of petroleum products and fractions that may decompose if distilled at atmospheric pressure. This boiling range, obtained at conditions designed to obtain approximately one theoretical plate fractionation, can be used in engineering calculations to design distillation equipment, to prepare appropriate blends for industrial purposes, to determine compliance with regulatory rules, to determine the suitability of the product as feed to a refining process, or for a host of other purposes.

[1] This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.08 on Volatility.

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[2] *Annual Book of ASTM Standards,* Vol 05.05.

[3] *Annual Book of ASTM Standards,* Vol 11.01.

[4] *Annual Book of ASTM Standards,* Vol 05.01.

[5] *Annual Book of ASTM Standards,* Vol 05.02.

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

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