



Designation: D323 – 20a

Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method)¹

This standard is issued under the fixed designation D323; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This test method covers procedures for the determination of vapor pressure (see **Note 1**) of gasoline, volatile crude oil, and other volatile petroleum products.

1.2 Procedure A is applicable to gasoline and other petroleum products with a vapor pressure of less than 180 kPa (26 psi).

1.3 Procedure B may also be applicable to these other materials, but only gasoline was included in the interlaboratory test program to determine the precision of this test method.

1.4 Procedure C is for materials with a vapor pressure of greater than 180 kPa (26 psi).

1.5 Procedure D for aviation gasoline with a vapor pressure of approximately 50 kPa (7 psi).

NOTE 1—Because the external atmospheric pressure is counteracted by the atmospheric pressure initially present in the vapor chamber, the Reid vapor pressure is an absolute pressure at 37.8 °C (100 °F) in kilopascals (pounds-force per square inch). The Reid vapor pressure differs from the true vapor pressure of the sample due to some small sample vaporization and the presence of water vapor and air in the confined space.

1.6 This test method is not applicable to liquefied petroleum gases or fuels containing oxygenated compounds other than methyl *t*-butyl ether (MTBE). For determination of the vapor pressure of liquefied petroleum gases, refer to Test Method **D1267** or Test Method **D6897**. For determination of the vapor pressure of gasoline-oxygenate blends, refer to Test Method **D4953**. The precision for crude oil has not been determined since the early 1950s (see **Note 3**). Test Method **D6377** has been approved as a method for determination of vapor pressure of crude oil. IP 481 is a test method for determination of the air-saturated vapor pressure of crude oil.

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

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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1.8 *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.* Specific warning statements are given in Sections **7** and **18**, and **12.5.3**, **15.5**, **21.2**, **A1.1.2**, **A1.1.6**, and **A2.3**.

1.9 *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

- D1267** Test Method for Gauge Vapor Pressure of Liquefied Petroleum (LP) Gases (LP-Gas 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
- D4306** Practice for Aviation Fuel Sample Containers for Tests Affected by Trace Contamination
- D4953** Test Method for Vapor Pressure of Gasoline and Gasoline-Oxygenate Blends (Dry Method)
- D5842** Practice for Sampling and Handling of Fuels for Volatility Measurement
- D5854** Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products
- D6377** Test Method for Determination of Vapor Pressure of Crude Oil: VPCR_x (Expansion Method)
- D6897** Test Method for Vapor Pressure of Liquefied Petroleum Gases (LPG) (Expansion Method)
- E1** Specification for ASTM Liquid-in-Glass Thermometers

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