



Standard Test Method for Vapor Pressure of Gasoline and Gasoline-Oxygenate Blends (Dry Method)¹

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1. Scope

1.1 This test method, a modification of Test Method D 323 (Reid Method), provides two procedures to determine the vapor pressure (Note 1) of gasoline and gasoline-oxygenate blends. This test method is applicable to gasolines and gasoline-oxygenate blends with a vapor pressure range from 35 to 100 kPa (5 to 15 psi) (see Note 2).

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

NOTE 2—Vapor pressure of gasoline or gasoline-oxygenate blends below 35 kPa (5 psi) or greater than 100 kPa (15 psi) can be determined with this test method but the Precision and Bias as described in Section 10 do not apply. For materials with a vapor pressure greater than 100 kPa (15 psi), use a 0 to 200 kPa (0 to 30 psi) gage as specified in the Annex of Test Method D 323.

1.2 Some gasoline-oxygenate blends may show a haze when cooled to 0 to 1°C. If a haze is observed in 8.4, it shall be indicated in the reporting of results. The precision and bias statements for hazy samples have not been determined (see Note 10).

1.3 The values stated in acceptable metric units are standard. The values given in parentheses are provided for information purposes 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.* Specific precautions are given in 6.5, and Note 5, Note 7, Note 8, Note A1.1, and Note A1.2.

2. Referenced Documents

2.1 ASTM Standards:

D 323 Test Method for Vapor Pressure of Petroleum Prod-

ucts (Reid Method)²

D 4057 Practice for Manual Sampling of Petroleum and Petroleum Products³

E 1 Specification for ASTM Thermometers⁴

3. Summary of Test Method

3.1 The liquid chamber of the vapor pressure apparatus is filled with the chilled sample and connected to the vapor chamber at 37.8°C (100°F). The apparatus is immersed in a bath at 37.8°C (100°F) until a constant pressure is observed. The pressure reading, suitably corrected, is reported as the vapor pressure.

3.2 Procedure A utilizes the same apparatus and essentially the same procedure as Test Method D 323 with the exception that the interior surfaces of the liquid and vapor chambers are maintained completely free of water. Procedure B utilizes a semi-automatic apparatus with the liquid and vapor chambers identical in volume to those in Procedure A. The apparatus is suspended in a horizontal bath and rotated while attaining equilibrium. Either a Bourdon gage or pressure transducer can be used with this procedure. The interior surfaces of the liquid and vapor chambers are maintained free of water.

4. Significance and Use

4.1 Vapor pressure is an important physical property of liquid spark-ignition engine fuels. It provides an indication of how a fuel will perform under different operating conditions. For example, vapor pressure is a factor in determining whether a fuel will cause vapor lock at high ambient temperature or at high altitude, or will provide easy starting at low ambient temperature.

4.2 Petroleum product specifications generally include vapor pressure limits to ensure products of suitable volatility performance.

NOTE 3—Vapor pressure of fuels is regulated by various government agencies.

5. Apparatus

5.1 The apparatus for Procedure A is described in Annex A1.

¹ This test method is under the jurisdiction of Committee D-2 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 05.01.

³ *Annual Book of ASTM Standards*, Vol 05.02.

⁴ *Annual Book of ASTM Standards*, Vol 14.03.

