



Standard Test Method for Gage Vapor Pressure of Liquefied Petroleum (LP) Gases (LP-Gas Method)¹

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1. Scope

1.1 This test method covers the determination of the gage vapor pressures of liquefied petroleum gas products at temperatures of 37.8°C (100°F) up to and including a test temperature of 70°C (158°F).

1.2 The values stated in acceptable metric units are to be regarded as the standard. The values in parentheses are for information only.

1.3 *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 3.2.1 and Annex A2.

2. Referenced Documents

2.1 ASTM Standards:²

D323 Test Method for Vapor Pressure of Petroleum Products (Reid Method)

D1265 Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method

E1 Specification for ASTM Liquid-in-Glass Thermometers

2.2 Institute of Petroleum Standard:

IP 181 Sampling Petroleum Gases³

3. Terminology

3.1 Definitions:

3.1.1 *vapor pressure*—the pressure exerted by the vapor of a liquid when in equilibrium with the liquid.

3.2 Definitions of Terms Specific to This Standard:

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.H0 on Liquefied Petroleum Gas.

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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.

³ Available from Applied Science Publishers, Ripple Rd., Barking, Essex, England

3.2.1 *liquefied petroleum gases*—narrow boiling range hydrocarbon mixtures consisting chiefly of propane or propylene, or both, (**Warning**—Extremely flammable. Harmful when inhaled.) butanes and butylenes, or both, in which the content of hydrocarbon compounds of higher boiling point than 0°C (32°F) is less than 5 % by liquid volume, and whose gage vapor pressure at 37.8°C (100°F) is not greater than approximately 1550 kPa (225 psi).

4. Summary of Test Method

4.1 The test apparatus, consisting of two interconnected chambers and equipped with a suitable pressure gage, is purged with a portion of the sample which is then discarded. The apparatus is then filled completely with the portion of the sample to be tested. Thirty-three and one-third to forty volume percent of the sample content of the apparatus is immediately withdrawn to provide adequate free space for product expansion. The apparatus is then immersed in a water bath maintained at the standard test temperature of 37.8°C (100°F) or, optionally, at some higher test temperature up to and including a test temperature of 70°C (158°F).

4.2 The observed gage pressure at equilibrium, after correcting for gage error and correcting to a standard barometric pressure, is reported as the LPG Vapor Pressure at the selected test temperature.

5. Significance and Use

5.1 Information on the vapor pressures of liquefied petroleum gas products under temperature conditions from 37.8 to 70°C (100 to 158°F) is pertinent to selection of properly designed storage vessels, shipping containers, and customer utilization equipment to ensure safe handling of these products.

5.2 Determination of the vapor pressure of liquefied petroleum gas is important for safety reasons to ensure that the maximum operating design pressures of storage, handling, and fuel systems will not be exceeded under normal operating temperature conditions.

5.3 For liquefied petroleum gases, vapor pressure is an indirect measure of the most extreme low temperature conditions under which initial vaporization can be expected to occur.