



Standard Practice for Storage and Use of Liquefied Petroleum Gases (LPG) in Sample Cylinders for LPG Test Methods¹

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1. Scope*

1.1 This practice covers information for the storage and use of LPG samples in standard cylinders of the type used in sampling method, Practice [D1265](#) and floating piston cylinders used in sampling method, Practice [D3700](#).

1.2 This practice is especially applicable when the LPG sample is used as a quality control (QC) reference material for LPG test methods, such as gas chromatography (GC) analysis (Test Method [D2163](#)) or vapor pressure (Test Method [D6897](#)) that use only a few mL per test, since relatively small portable Department of Transportation (DOT) cylinders (for example, 20 lb common barbecue cylinders) can be used. This practice can be applied to other test methods. However, test methods that require a large amount of sample per test (for example, manual vapor pressure Test Method [D1267](#)) will require QC volumes in excess of 1000 L if stored in standard DOT cylinders or American Society of Mechanical Engineers (ASME) vessels.

2. Referenced Documents

2.1 ASTM Standards:²

[D1265 Practice for Sampling Liquefied Petroleum \(LP\) Gases, Manual Method](#)

[D1267 Test Method for Gage Vapor Pressure of Liquefied Petroleum \(LP\) Gases \(LP-Gas Method\)](#)

[D2163 Test Method for Determination of Hydrocarbons in Liquefied Petroleum \(LP\) Gases and Propane/Propene Mixtures by Gas Chromatography](#)

[D3700 Practice for Obtaining LPG Samples Using a Floating Piston Cylinder](#)

[D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical](#)

¹ This practice 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.

Measurement System Performance

[D6897 Test Method for Vapor Pressure of Liquefied Petroleum Gases \(LPG\) \(Expansion Method\)](#)

3. Terminology

3.1 Definitions:

3.1.1 *floating piston cylinder (FPC), n*—high-pressure sample container with a free-floating internal piston that effectively divides the container into two separate compartments.

3.1.1.1 *Discussion*—A floating piston cylinder is used to collect a sample of liquid under pressure without the formation of a gaseous phase which can result in changes in the composition of the liquid sample.

3.1.2 *high-pressure sample cylinder, n*—a container used for storage and transportation of a sample obtained at pressures above atmospheric pressure.

3.1.2.1 *Discussion*—This type of sample cylinder, sometimes called a 'standard 80 % fill cylinder', when used for LPG typically contains both liquid and vapor phase material.

3.1.3 *liquefied petroleum gas, (LP Gas, LPG), n*—a narrow boiling range mixture of hydrocarbons consisting of propane, propylene, butanes and butylenes, individually or in specified combinations, with limited amounts of other hydrocarbons and naturally occurring non-hydrocarbons.

3.1.3.1 *Discussion*—LPG is typically maintained in a liquid state by containing it within a closed container or storage tank that can withstand the vapor pressure of the LPG at ambient temperature, or at a low temperature in refrigerated storage.

3.1.4 *maximum fill volume (reduced fill volume), n*—the volume of a container that may be safely occupied by the liquid sample, usually expressed as a percentage of the total capacity.

3.1.4.1 *Discussion*—Some regulatory agencies use the expressions 'maximum fill density' and 'reduced fill density.'

4. Summary of Practice

4.1 This practice provides information for the design and operation of LPG sample storage cylinders taking into account properties of LPG and types of cylinders in common use for storage of LPG.

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