



Standard Practice for Obtaining LPG Samples Using a Floating Piston Cylinder¹

This standard is issued under the fixed designation D 3700; 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.

1. Scope

1.1 This practice covers the equipment and procedures for obtaining a representative sample of specification liquefied petroleum gas (LPG), such as specified in Specification D 1835, GPA 2140, and comparable international standards. It may also be used for other natural gas liquid (NGL) products that are normally single phase (NGL mix, field butane, and so forth), defined in other industry specifications or contractual agreements.

1.2 This practice is not intended for non-specification products that contain significant quantities of undissolved gases (N₂, CO₂), free water or other separated phases, such as raw or unprocessed gas/liquids mixtures and related materials. The same equipment can be used for these purposes, but additional precautions are generally needed to obtain representative samples of multi-phase products (see Appendix X1).

1.3 This practice includes recommendations for the location of a sample point in a line or vessel. It is the responsibility of the user to ensure that the sampling point is located so as to obtain a representative sample.

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

1.5 *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.*

2. Referenced Documents

2.1 ASTM Standards:

D 1265 Practice for Sampling Liquefied Petroleum (LP) Gases (Manual Method)²

D 1835 Specification for Liquefied Petroleum (LP) Gases²

2.2 GPA Standards:³

GPA 2174 Obtaining Liquid Hydrocarbon Samples for Analysis by Gas Chromatography

GPA 2140 Liquefied Petroleum Gas Specifications and Test Methods

3. Terminology

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

3.2 *maximum fill density (reduced fill density)*—the volume of a container occupied by the sample, usually expressed as a percentage of the total capacity.

4. Summary of Practice

4.1 A liquid LPG sample is transferred under pressure from a sample point to a floating piston cylinder. The floating piston cylinder (FPC) is designed to collect liquid samples with no vaporization by displacing a piston against a pressurizing fluid (usually an inert gas). The piston serves as a physical barrier between the sample and the pressurizing fluid, at the sampling pressure. The position of the piston at the end of sampling indicates the percent fill of the sample cylinder.

4.2 It is the responsibility of the user of this practice to locate the sample point at a suitable location where the product being sampled is a representative, single phase, homogeneous liquid.

5. Significance and Use

5.1 This practice allows the collection of a representative sample of LPG that may contain trace volatile components such as methane, nitrogen, and ethane. Sampling by Practice D 1265 may result in a small, but predictable loss of these lighter components. Practice D 1265 is suitable for collecting samples for routine specification testing, as the small loss of light components is not significant under Specification D 1835 specification requirements. Practice D 3700 is recommended whenever highly accurate determination of light components is required. For example, composition determined on samples collected according to Practice D 3700 may be used to establish product value of NGL mixtures (see Appendix X1).

6. Interferences

6.1 An interference in a sampling procedure is anything which compromises the integrity of the sample.

¹ This practice is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.H on Liquefied Petroleum Gases.

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² *Annual Book of ASTM Standards*, Vol 05.01.

³ Available from Gas Processors Assoc., 6526 E. 60th Street, Tulsa, OK 74145.