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# Standard Practice for Sampling Liquefied Petroleum (LP) Gases (Manual Method)[1]

This standard is issued under the fixed designation D 1265; 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 procedures for obtaining representative samples of liquefied petroleum gases such as propane, butane, or mixtures thereof, in containers other than those used in laboratory testing apparatus. These procedures are considered adequate for obtaining representative samples for all routine tests for LP gases required by Specification D 1835 except analysis by Test Method D 2163. They are not intended for obtaining samples to be used for compositional analysis. A sample procedure that avoids changes in composition must be used for compositional analysis.

NOTE 1—Practice D 3700 describes a recommended method for obtaining a representative sample of a hydrocarbon fluid and the subsequent preparation of that sample for laboratory analysis.

1.2 *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 1835 Specification for Liquefied Petroleum (LP) Gases[2]

D 2163 Test Method for Analysis of Liquefied Petroleum (LP) Gases and Propene Concentrates by Gas Chromatography[2]

D 3700 Practice for Containing Hydrocarbon Fluid Samples Using a Floating Piston Cylinder[3]

## 3. Summary of Practice

3.1 A liquid sample is transferred from the source into a sample container by purging the container and filling it with liquid, then providing 20 % outage so that 80 % of the liquid volume remains.

## 4. Significance and Use

4.1 Samples of liquefied petroleum gases are examined by various test methods to determine physical and chemical characteristics. The test results are often used for custody transfer and pricing determination. It is therefore essential that the samples be representative of the product to be tested.

## 5. General Information

5.1 Considerable effort is required to obtain a representative sample, especially if the material being sampled is a mixture of liquefied petroleum gases. The following factors must be considered:

5.1.1 Obtain samples of the liquid phase only.

5.1.2 When it is definitely known that the material being sampled is composed predominantly of only one liquefied petroleum gas, a liquid sample may be taken from any part of the vessel.

5.1.3 When the material being sampled has been agitated until uniformity is assured, a liquid sample may be taken from any part of the vessel.

5.1.4 Because of wide variation in the construction details of containers for liquefied petroleum gases, it is difficult to specify a uniform method for obtaining representative samples of heterogeneous mixtures. If it is not practicable to agitate a mixture for homogeneity, obtain liquid samples by a procedure which has been agreed upon by the contracting parties.

5.1.5 Directions for sampling cannot be made explicit enough to cover all cases. They must be supplemented by judgment, skill, and sampling experience. Extreme care and good judgment are necessary to ensure samples which represent the general character and average condition of the material. Because of the hazards involved, liquefied petroleum gases should be sampled by, or under the supervision of, persons familiar with the necessary safety precautions.

NOTE 2—Samples to be tested for presence of corrosive compounds or sulfur compounds should be taken in stainless steel containers equipped with stainless steel valves; otherwise, determinations of mercaptans and hydrogen sulfide, for example, can be misleading.

5.1.6 Hydrocarbon vapors vented during sampling must be controlled to assure compliance with applicable safety and environmental regulations.

## 6. Apparatus

6.1 *Sample Container*—Use metal sample containers of a type that ensures maximum safety and are resistant to corrosion by the product being sampled. A suitable material is stainless steel. The size of the container depends upon the amount of sample required for the laboratory tests to be made. The sample container should be fitted with an internal outage (ullage) tube

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

[3] *Annual Book of ASTM Standards*, Vols 05.02.

to permit release of 20 % of the container capacity. The end of the container fitted with the outage (ullage) tube shall be clearly marked. Typical sample containers are shown in Fig. 1 and Fig. 2 . If the container is to be transported, it must often conform to specifications published in Tariff No. 10, "I.C.C. Regulations for Transportation of Explosives and Other Dangerous Articles," its supplements, or reissues, or similar regulations in other jurisdictions.

6.2 *Sample Transfer Line* made of stainless steel tubing or other flexible metal hose, impervious to the product being sampled, is required. The most satisfactory line is one equipped with two valves on the sample-container end, Fig. 1, a control valve, *A*, and a vent valve, *B*.

## PROCEDURE

### 7. Purging Sample Transfer Line

7.1 Connect the ends of the transfer line securely to the product source and to the inlet valve *C* of the container. Close the control valve *A*, vent valve *B*, and inlet valve *C*, Fig. 1. Open the valve at the product source and purge the transfer line by opening the control valve *A* and the vent valve *B*.

### 8. Purging the Sample Container

8.1 If the history of the sample container contents is not known or if traces of the previous product could affect the analysis to be carried out, or both, use the following purge procedure:

8.1.1 Connect valve D of the sample container to the sample transfer line with the container in an upright position and valve C at the top (Fig. 2).

8.1.2 Close valves B, C, and D. Open valve A and then valves C and D. Fill sample container until liquid issues from valve C. Close valves C and D, then valve A on the sampling line.

8.1.3 Loosen the connection joining the sample container to the sample line and turn container through 180° such that valve D is at the top. Open valves C and D and drain out liquid.

8.1.4 Return the sample container to position valve C at the top. Tighten connection to sample transfer line and repeat the purging operation at least three times.

8.2 If the history of the sample container contents is known and would not affect the analysis, use the following purge procedure:

8.2.1 With the container in an upright position, Fig. 1, and its outlet valve D at the top, close vent valve B and inlet valve C and open control valve A. Open inlet valve C and partly fill the container with sample by slowly opening the outlet valve D. Close the control valve A and allow part of the sample to escape in the vapor phase through outlet valve D. Close outlet valve D and release the remainder of the sample in the liquid phase by opening vent valve B. Repeat the purging operation at least three times.

### 9. Transfer of Sample

9.1 Position the sample container securely in an upright position with outlet valve D at the top (Fig. 1) and both valves C and D closed.

9.1.1 Close vent valve B, open the control valve A, open inlet valve C, and fill container with the sample. Close inlet valve C and the valve at the product source. Open vent valve B. After the pressure is fully reduced, disconnect sample container from the transfer line. Discard the sample if a leak develops or if either valve is opened during subsequent handling of the sample container before performing the outage (ullage) operations outlined in 10.

### 10. Sample Outage (Ullage)

10.1 Immediately after obtaining the sample, place the

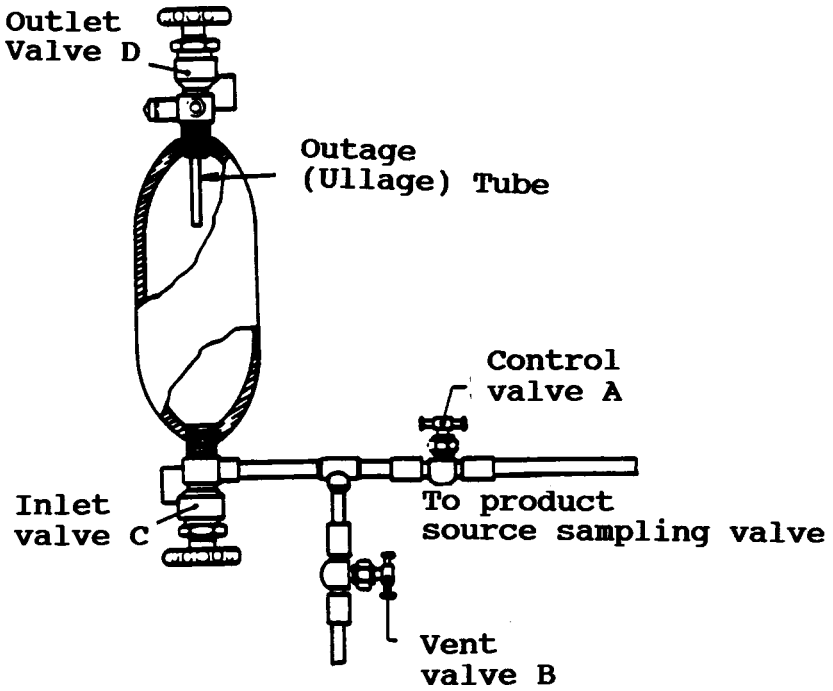


**FIG. 1 Typical Sample Container and Sampling Connections**

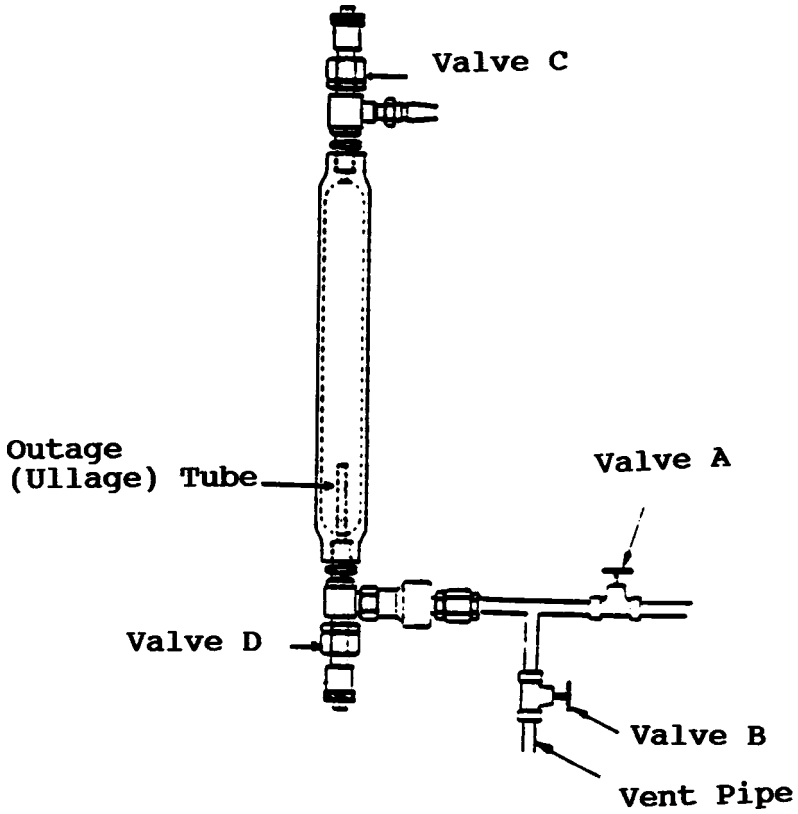


**FIG. 2 Typical Sample Container and Alternate Purging Connections**

container in an upright positioin with the outage (ullage) tube at the top.

10.1.1 Open outlet valve D slightly. Allow excess liquid to escape and close the valve at the first sign of vapor. If no liquid escapes, discard the sample and refill the container.

## 11. Checking for Leaks

11.1 After eliminating the excess liquid so that only 80 % of the sample remains, immerse in a water bath and check for leaks. If a leak is detected at any time during the sampling operation, discard the sample. Repair or replace the leaky container before obtaining another sample.

## 12. Care of Samples

12.1 Place samples in a cool location as soon as possible. Keep them there until all tests have been completed. Discard any samples in containers which develop leaks. Protect the valves on the sample container, either by packing the container in a crate in an approved manner or by using a protective cap, so that accidental unseating of the valve or tampering with it is avoided.

## 13. Keywords

13.1 liquified petroleum gases; LPG; sampling

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