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Standard Test Method for Dryness of Propane (Valve Freeze Method)¹

This standard is issued under the fixed designation D2713; 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 test method covers the measurement of the dryness of propane products that do not contain antifreeze agents such as, but not limited to, commercial propane and special duty propane (see Specification D1835).

1.2 The values stated in SI 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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

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

D1835 Specification for Liquefied Petroleum (LP) Gases

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *freeze-off time, n*—the time, in s, for a propane water test valve to freeze under the conditions of this test method.

3.1.2 *propane water test valve, n*—a specific valve designed and manufactured for performing in this test method.

3.1.3 *valve freeze, adj*—relating to the procedure for determining the dryness of propane for this test method.

4. Summary of Test Method

4.1 A liquid-phase sample of the product to be tested is flowed through the propane water test valve to cool the valve

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.

body. After cooling, the test valve is partially closed to a small preset flow rate and the time required for the valve to freeze, due to water dissolved in the sample and thus interrupt the normal flow, is recorded. Higher dissolved water concentrations will result in shorter freeze-off times. The average observed time for several successive observations is recorded as the observed valve freeze time.

5. Significance and Use

5.1 This test is a functional test in which the water concentration in the product is related to product behavior characteristics in a pressure-reducing system of special design to arrive at a measure of product acceptability in common use applications. Experience has demonstrated that excessive water content (dissolved water) will cause freeze-up difficulties in pressure reducing systems.

6. Interferences

6.1 Antifreeze agents will interfere with this test method and can indicate that the product is drier than it really is. However, the relative freeze-off times of such materials tested by this procedure can be an indication of the tendency of these products to cause freezing in pressure-reducing regulators.

7. Apparatus

7.1 *Propane Water Test Valve*³—A specially constructed and calibrated valve manufactured solely for this test (Note 1). The valve has two open positions, a wide open position for flushing, and a small preset flow position for testing.

NOTE 1—The propane water test valve is a precision instrument and it should be so treated. It should not be dropped, strained in any way, or disassembled, except to clean the filter in accordance with the manufacturer's instructions. Valves suspected of being defective should be returned to the manufacturer for inspection, reconditioning or recalibration.

7.2 *Stop Watch or Timer*, measuring in seconds.

7.3 *LP Gas Sample Cylinder*, having a minimum capacity of 11 L (3 U.S. gal).

³ Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR:D02-1423.

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