



Designation: D 2713 – 91 (Reapproved 2001)

An American National Standard



Designation: 395/98

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

This standard is issued under the fixed designation D 2713; 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-type products such as, but not limited to, commercial propane (see Specification D 1835).

NOTE 1—This test method is not applicable to propane-type products containing antifreeze agents. However, the relative freeze times of such materials tested by this procedure may be an indication of the tendency of these products to cause freezing in pressure reducing regulators.

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:

- D 1265 Practice for Sampling Liquefied Petroleum (LP) Gases - Manual Method²
- D 1835 Specification for Liquefied Petroleum (LP) Gases²

3. Summary of Test Method

3.1 A liquid-phase sample of the product to be tested is flowed through the propane water test valve to cool the valve body. After cooling, the test valve is partially closed to a small preset flow rate and the time required for the valve to freeze, and thus interrupt the normal flow, is recorded. The average observed time for several successive observations is recorded as the observed freeze time.

4. Significance and Use

4.1 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.

5. Apparatus

5.1 *Propane Water Test Valve*³—A specially constructed and calibrated valve manufactured solely for this test (Note 2). The valve has two open positions, a wide open position for flushing, and a small preset flow position for testing.

NOTE 2—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.

5.2 Stop Watch.

5.3 Sample Cylinder, having a minimum capacity of 11.4 L (3 gal).

5.4 *Cloth*, dry, clean.

6. Sampling

6.1 The sensitivity of moisture test measurements to uncontrollable sampling errors is such as to warrant conducting all important tests at the propane supply source rather than on samples taken from the bulk supply. Referee tests should be conducted on the bulk supply.

6.2 If the test cannot be run by connecting the apparatus directly to the bulk propane supply, a sample can be taken into a sample cylinder having a minimum capacity of 11.4 L. In such cases, the sample shall be taken strictly in accordance with directions given in Practice D 1265.

7. Procedure

7.1 Connect (Note 3) the propane water test valve to the liquid line of the bulk product source or to the liquid phase connection of the sample cylinder described in 6.2, so that the body of the valve is horizontal and the outlet opening is aimed vertically upward. The valve should be positioned so that the

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.01 on Liquefied Petroleum Gas.

Current edition approved March 15, 1991. Published July 1991. Originally published as D 2713 – 68 T. Last previous edition D 2713 – 86.

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

³ A list of suppliers of LP-Gas freeze valves is available from ASTM as a research report. Request D02-1423.