



Designation: D1071 – 17

Standard Test Methods for Volumetric Measurement of Gaseous Fuel Samples¹

This standard is issued under the fixed designation D1071; 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 These test methods cover the volumetric measuring of gaseous fuel samples, including liquefied petroleum gases, in the gaseous state at normal temperatures and pressures. The apparatus selected covers a sufficient variety of types so that one or more of the methods prescribed may be used for laboratory, control, reference, or in fact any purpose where it is desired to know the quantity of gaseous fuel or fuel samples under consideration. The various types of apparatus are listed in [Table 1](#).

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.*

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Terminology and Units of Measurement

2.1 **Definitions: Units of Measurement**—All measurements shall be expressed in inch-pound units (that is: foot, pound (mass), second, and degrees Fahrenheit); or metric units (that is: metre, kilogram, second, and degrees Celsius).

2.2 **Standard Conditions**, at which gaseous fuel samples shall be measured, or to which such measurements shall be referred, are as follows:

2.2.1 Inch-pound Units:

- (1) A temperature of 60.0°F,
- (2) A pressure of 14.73 psia.
- (3) Free of water vapor or a condition of complete water-vapor saturation as specified per individual contract between interested parties.

2.2.2 SI Units:

¹ These test methods are under the jurisdiction of ASTM Committee D03 on Gaseous Fuels and are the direct responsibility of Subcommittee D03.01 on Collection and Measurement of Gaseous Samples.

Current edition approved April 1, 2017. Published April 2017. Originally approved in 1954. Last previous edition approved in 2003 as D1071 – 83 (2003) which was withdrawn January 2017. DOI: 10.1520/D1071-17.

(1) A temperature of 288.15K (15°C).

(2) A pressure of 101.325 kPa (absolute).

(3) Free of water vapor or a condition of complete water-vapor saturation as specified per individual contract between interested parties.

2.3 Standard Volume:

2.3.1 **Standard Cubic Foot of Gas** is that quantity of gas which will fill a space of 1.000 ft³ when under the standard conditions ([2.2.1](#)).

2.3.2 **Standard Cubic Metre of Gas** is that quantity of gas which will fill a space of 1.000 m³ when under the standard conditions ([2.2.2](#)).

2.4 **Temperature Term for Volume Reductions**—For the purpose of referring a volume of gaseous fuel from one temperature to another temperature (that is, in applying Charles' law), the temperature terms shall be obtained by adding 459.67 to each temperature in degrees Fahrenheit for the inch-pound units or 273.15 to each temperature in degrees Celsius for the SI units.

2.5 At the present state of the art, metric gas provers and meters are not routinely available in the United States. Throughout the remainder of this procedure, the inch-pound units are used. Those having access to metric metering equipment are encouraged to apply the standard conditions expressed in [2.2.2](#).

NOTE 1—The SI conditions given here represent a “hard” metrication, in that the reference temperature and the reference pressure have been changed. Thus, amounts of gas given in metric units should always be referred to the SI standard conditions and the amounts given in inch-pound units should always be referred to the inch-pound standard conditions.

3. Significance and Use

3.1 The knowledge of the volume of samples used in a test is necessary for meaningful results. Validity of the volume measurement equipment and procedures must be assured for accurate results.

4. Apparatus

4.1 The various types of apparatus used for the measurement of gaseous fuel samples may be grouped in three classes, as shown in [Table 1](#). References to the portions of these methods covering the capacity and range of operating conditions, and the calibration, of each type are given in [Table 1](#).