



Designation: D1835 – 18a

## Standard Specification for Liquefied Petroleum (LP) Gases<sup>1</sup>

This standard is issued under the fixed designation D1835; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope\*

1.1 This specification covers those products commonly referred to as liquefied petroleum gases, consisting of propane, propene (propylene), butane, and mixtures of these materials. Four basic types of liquefied petroleum gases are provided to cover the common use applications.

1.2 This specification is applicable to products intended for use as domestic, commercial and industrial heating, and engine fuels.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.3.1 The non-SI unit 'psig' is the standard unit for footnote B of [Table 1](#) because that unit of measurement is widely used in North American industry.

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *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.*

- D1267 Test Method for Gauge Vapor Pressure of Liquefied Petroleum (LP) Gases (LP-Gas Method)
- D1657 Test Method for Density or Relative Density of Light Hydrocarbons by Pressure Hydrometer
- D1837 Test Method for Volatility of Liquefied Petroleum (LP) Gases (Withdrawn 2017)<sup>3</sup>
- D1838 Test Method for Copper Strip Corrosion by Liquefied Petroleum (LP) Gases
- D2158 Test Method for Residues in Liquefied Petroleum (LP) Gases
- D2163 Test Method for Determination of Hydrocarbons in Liquefied Petroleum (LP) Gases and Propane/Propene Mixtures by Gas Chromatography
- D2420 Test Method for Hydrogen Sulfide in Liquefied Petroleum (LP) Gases (Lead Acetate Method)
- D2598 Practice for Calculation of Certain Physical Properties of Liquefied Petroleum (LP) Gases from Compositional Analysis
- D2713 Test Method for Dryness of Propane (Valve Freeze Method)
- D3700 Practice for Obtaining LPG Samples Using a Floating Piston Cylinder
- D5504 Test Method for Determination of Sulfur Compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Chemiluminescence
- D5623 Test Method for Sulfur Compounds in Light Petroleum Liquids by Gas Chromatography and Sulfur Selective Detection

**TABLE 1 Detailed Requirements for Liquefied Petroleum Gases**

	Product Type				ASTM Test Methods (see Section 2)
	Commercial Propane	Commercial Butane	Commercial PB Mixtures	Special-Duty Propane <sup>A</sup>	
Vapor pressure at 37.8 °C (100 °F), kPa (psig) max	1435 (208)	483 (70)	<sup>B</sup>	1435 (208)	D1267 <sup>C</sup> or D2598 or D6897
Heavier hydrocarbon contaminants: <sup>D</sup>					
Butane and heavier, <sup>E</sup> % by volume, max	2.5	...	...	2.5	D2163
Pentane and heavier, <sup>F</sup> % by volume, max	...	2.0	2.0	...	D2163
Propylene content, % by volume, max	...	...	...	5.0	D2163
Residual matter: <sup>G,H</sup>					
One of the following requirements shall be met:					
(1) Residue on evaporation of 100 mL, mL, max, and Oil stain observation	0.05 pass <sup>I</sup>	0.05 pass <sup>I</sup>	0.05 pass <sup>I</sup>	0.05 pass <sup>I</sup>	D2158 <sup>J</sup> D2158 <sup>J</sup>
or					
(2) Residue by gas chromatography, mg/kg, max	350	350	350	350	D7756
Density at 15 °C or relative density at 15.6 °C/15.6 °C (60 °F/60 °F)	$\kappa$	$\kappa$	$\kappa$	...	D1657 or D2598
Corrosion, copper, strip	No. 1	No. 1	No. 1	No. 1	D1838 <sup>L</sup>
Sulfur, mg/kg (ppm by mass), max	185 <sup>M</sup>	140 <sup>M</sup>	140 <sup>M</sup>	123 <sup>M</sup>	D6667
Hydrogen sulfide	pass	pass	pass	pass	D2420
Moisture content	pass	...	...	pass	D2713
Free water content	...	none <sup>N</sup>	none <sup>N</sup>	...	...

<sup>A</sup> Equivalent to Propane HD-5 of GPA Standard 2140.

<sup>B</sup> The permissible vapor pressures of products classified as PB mixtures shall not exceed 208 psig (1435 kPa) and additionally shall not exceed the pressure calculated in psig from the following relationship between the observed vapor pressure at 100 °F (37.8 °C) and the observed relative density at either 60 °F or 15.6 °C:

Vapor pressure, psig, max

$$= 1167 - 1880 (\text{relative density at } 60 \text{ }^\circ\text{F}/60 \text{ }^\circ\text{F}) \quad (1)$$

$$= 1167 - 1880 (\text{relative density at } 15.6 \text{ }^\circ\text{C}/15.6 \text{ }^\circ\text{C}) \quad (2)$$

A specific mixture shall be designated by the vapor pressure at 100 °F in pounds per square inch gauge. To comply with the designation, the vapor pressure of the mixture shall be within +0 psi to -10 psi of the vapor pressure specified.

<sup>C</sup> In case of dispute about the vapor pressure of a product, the value actually determined by Test Method D1267 shall prevail over the value calculated by Practice D2598 or measured by Test Method D6897.

<sup>D</sup> See X1.2.2.3.