



Designation: D2598 – 21

Standard Practice for Calculation of Certain Physical Properties of Liquefied Petroleum (LP) Gases from Compositional Analysis¹

This standard is issued under the fixed designation D2598; 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, by compositional analysis, the approximate determination of the following physical characteristics of commercial propane, special-duty propane, commercial propane/butane mixtures, and commercial butane (covered by Specification **D1835**): vapor pressure, relative density, and motor octane number (MON).

1.1.1 This practice is not applicable to any product exceeding specifications for nonvolatile residues. (See Test Method **D2158**.)

1.1.2 For calculating motor octane number, this practice is applicable only to mixtures containing 20 % or less of propene.

1.1.3 For calculated motor octane number, this practice is based on mixtures containing only components shown in **Table 1**.

1.2 The values stated in SI units are to be regarded as standard.

1.2.1 Exceptions:

1.2.1.1 Non-SI units in parentheses are given for information only.

1.2.1.2 Motor octane number and relative density are given in MON numbers and dimensionless units, respectively.

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. Referenced Documents

2.1 ASTM Standards:²

D1267 Test Method for Gauge Vapor Pressure of Liquefied

¹ This practice is under the jurisdiction of ASTM Committee **D02** on Petroleum Products, Liquid Fuels, 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.

Petroleum (LP) Gases (LP-Gas Method)

D1657 Test Method for Density or Relative Density of Light Hydrocarbons by Pressure Hydrometer

D1835 Specification for 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

D2421 Practice for Interconversion of Analysis of C₅ and Lighter Hydrocarbons to Gas-Volume, Liquid-Volume, or Mass Basis

2.2 *Australian Liquefied Petroleum Gas Association Publication*.³

Liquefied Petroleum Gas for Automotive Use Specification

2.3 *Gas Processors Suppliers Association*.⁴

GPAA Engineering Data Book, 12th Edition, 2004

3. Summary of Practice

3.1 The composition of a sample of LP-gas is obtained by using Test Method **D2163** or other acceptable method. From the analysis (expressed in liquid volume percent), the vapor pressure, relative density, and motor octane number of the sample may be determined.

3.2 Conversion of a compositional analysis from mole, gas volume, or weight basis to liquid volume is obtained by using Practice **D2421** or other suitable method.

4. Significance and Use

4.1 Vapor pressure is an important specification property of commercial propane, special duty propane, propane/butane mixtures, and commercial butane that assures adequate vaporization, safety, and compatibility with commercial appliances. Relative density, while not a specification criterion, is necessary for determination of filling densities and custody

³ Available from Australian Liquefied Petroleum Gas Association Limited, ABN 11002703951, 30 George Street, Redfern NSW 2016, <http://www.lpgaustralia.com.au/site/>

⁴ Available from Gas Processors Suppliers Association (GPAA), 6526 E. 60th St., Tulsa, OK 74145, <http://www.gpaa.org>.

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