



Standard Test Method for Residues in Liquefied Petroleum (LP) Gases by Gas Chromatography with Liquid, On-Column Injection¹

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1. Scope*

1.1 This test method covers the determination, by gas chromatography, of soluble hydrocarbon materials, sometimes called “oily residue,” which can be present in Liquefied Petroleum (LP) Gases and which are substantially less volatile than the LPG product.

1.2 This test method quantifies, in the range of 10 to 600 mg/kg (ppm mass), the residue with a boiling point between 174°C and 522°C (C_{10} to C_{40}) in LPG. Higher boiling materials, or materials that adhere permanently to the chromatographic column, will not be detected.

1.3 [Appendix X3](#) and [Appendix X4](#) describe additional applications which could be performed based on the hardware and procedures described in this test method. [Appendix X3](#) describes a test procedure for expanding the analysis range to benzene, and [Appendix X4](#) describes a test procedure for the analysis of diisopropanolamine in LPG.

1.4 *Units*—The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

1.5 *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](#)

¹ This test method 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.

[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 \$C_5\$ and Lighter Hydrocarbons to Gas-Volume, Liquid-Volume, or Mass Basis](#)

[D2598 Practice for Calculation of Certain Physical Properties of Liquefied Petroleum \(LP\) Gases from Compositional Analysis](#)

[D3700 Practice for Obtaining LPG Samples Using a Floating Piston Cylinder](#)

[D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance](#)

[D6300 Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products and Lubricants](#)

[D6667 Test Method for Determination of Total Volatile Sulfur in Gaseous Hydrocarbons and Liquefied Petroleum Gases by Ultraviolet Fluorescence](#)

[E355 Practice for Gas Chromatography Terms and Relationships](#)

[E594 Practice for Testing Flame Ionization Detectors Used in Gas or Supercritical Fluid Chromatography](#)

3. Terminology

3.1 *Definitions of Terms Concerning Chromatography*—This test method makes reference to many common gas chromatographic procedures, terms, and relationships. Detailed definitions of these can be found in Practices [E355](#) and [E594](#).

3.2 *Definitions of Terms Concerning Liquefied Petroleum Gases*—This test method makes reference to the definitions of liquefied petroleum gases as described in Specification [D1835](#).

3.3 *Definitions of Terms Specific to This Standard:*

3.3.1 *high pressure liquefied gas injector, n*—Sample introduction device which injects liquefied gas samples under pressure and at room temperature directly onto the chromatographic column thereby maintaining the sample in liquid phase during the injection process.

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