



Designation: D7901 – 23

Standard Specification for Dimethyl Ether for Fuel Purposes¹

This standard is issued under the fixed designation D7901; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

1. Scope*

1.1 This specification covers dimethyl ether (DME) for use as a fuel in engines specifically designed or modified for DME and for blending with liquefied petroleum gas (LPG). This specification is for use by manufacturers of dimethyl ether, by engine developers of purpose-built engines, in contracts for the purchase of DME for fuel purposes, and for the guidance of consumers of this type of fuel.

NOTE 1—The generation and dissipation of static electricity can create problems in the handling of DME. For more information on the subject, see Guide [D4865](#).

1.2 The values stated in SI units are to be regarded as standard. Units 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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

- [D1265](#) Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method
- [D1267](#) Test Method for Gauge Vapor Pressure of Liquefied Petroleum (LP) Gases (LP-Gas Method)
- [D1838](#) Test Method for Copper Strip Corrosion by Liquefied Petroleum (LP) Gases

¹ This specification 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
- [D3700](#) Practice for Obtaining LPG Samples Using a Floating Piston Cylinder
- [D4865](#) Guide for Generation and Dissipation of Static Electricity in Petroleum Fuel Systems
- [D6667](#) Test Method for Determination of Total Volatile Sulfur in Gaseous Hydrocarbons and Liquefied Petroleum Gases by Ultraviolet Fluorescence
- [D6897](#) Test Method for Vapor Pressure of Liquefied Petroleum Gases (LPG) (Expansion Method)
- [D7756](#) Test Method for Residues in Liquefied Petroleum (LP) Gases by Gas Chromatography with Liquid, On-Column Injection
- [D7828](#) Test Method for Determination of Residue Composition in Liquefied Petroleum Gas (LPG) Using Automated Thermal Desorption/Gas Chromatography (ATD/GC) (Withdrawn 2021)³

2.2 Other Documents:

- [NFPA 77](#) Recommended Practice on Static Electricity⁴
- [ISO 17196](#) Dimethyl ether (DME) for fuels—Determination of impurities—Gas chromatographic method⁵
- [ISO 17197](#) Dimethyl ether (DME) for fuels—Determination of water content—Karl Fischer titration method⁵

3. Terminology

3.1 Abbreviations:

- 3.1.1 *DME*—dimethyl ether, the chemical compound (CH_3OCH_3).
- 3.1.2 *LPG*—liquefied petroleum gas.

4. Hazards

4.1 *Warning*—Dimethyl ether is a highly flammable, colorless gas with a faint ether-like odor. It is shipped and stored in

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, <http://www.nfpa.org>.

⁵ Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, <http://www.iso.org>.

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