



Designation: D8251 – 23

Standard Practice for Determining Compressor Oil Carryover in Compressed Natural Gas Used as a Natural Gas Motor Vehicle Fuel¹

This standard is issued under the fixed designation D8251; 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 standard practice is intended for gravimetric determination of compressor oil carryover as aerosols using either a coalescing filter method or sorbent tube method.

1.2 The method using coalescing filters is applicable to analysis of compressor or lube oil carryover as a liquid and is intended for long term monitoring of a compressed natural gas (CNG) dispenser system.

1.3 The method using a sorbent tube is applicable to analysis of compressor or lube oil carryover as a vapor and liquid in CNG dispenser systems present at 1 mg/kg to 500 mg/kg in a sample volume of 0.2 m³ to 0.6 m³. This method is applicable to a measurement intended to replicate the filling of a vehicle.

1.4 This standard shall be applicable to natural gas, biogas, or renewable natural gas (RNG) that is compressed for use as a fuel for internal combustion engines in motor vehicles.

1.5 This standard shall be applicable to natural gas, biogas, or renewable natural gas when they have been blended with hydrogen and have been compressed for use as a fuel for internal combustion engines in motor vehicles.

1.6 The user shall determine if the volumetric measuring elements of the dispensing system are adjusted for the composition of gaseous fuel blends being delivered and those volumetric measuring elements correctly calculate the volume of fuel delivered. The users shall apply appropriate correction factors if necessary.

1.7 *Units*—The values stated in SI units are to be regarded as standard.

1.8 Mention of trade names or organizations in this standard does not constitute endorsement or recommendation. Other manufacturers of equipment or equipment models can be used.

1.9 *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.

1.10 *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

D1070 [Test Methods for Relative Density of Gaseous Fuels](#)
D3588 [Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels](#)

[D4150 Terminology Relating to Gaseous Fuels](#)

E617 [Specification for Laboratory Weights and Precision Mass Standards](#)

2.2 *ISO Standard:*³

[ISO 15970:2008 Natural gas—Measurement of properties—Volumetric properties: density, pressure, temperature, and compression factor](#)

3. Terminology

3.1 For definitions of terms used D03 Gaseous Fuels standards, refer to Terminology [D4150](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *natural gas vehicle (NGV)*, *n*—vehicle designed to operate on compressed natural gas (CNG), liquefied natural gas (LNG), or renewable natural gas (RNG).

4. Summary of Practice

4.1 This practice describes construction of an apparatus for collecting compressor oil contained in CNG as well as a procedure for collecting and gravimetrically measuring compressor oil in CNG.

¹ This practice is under the jurisdiction of ASTM Committee D03 on Gaseous Fuels and is the direct responsibility of Subcommittee D03.05 on Determination of Special Constituents of Gaseous Fuels.

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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.

³ Available from International Organization for Standardization (ISO), ISO Central Secretariat, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <https://www.iso.org>.