



Designation: D7651 – 24^{ε1}

Standard Test Method for Gravimetric Measurement of Particulate Concentration of Hydrogen Fuel¹

This standard is issued under the fixed designation D7651; 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.

^{ε1} NOTE—Editorially corrected Section 14 in July 2024.

1. Scope

1.1 This test method is primarily intended for gravimetric determination of particulate concentration in hydrogen intended as a fuel for fuel cell or internal combustion engine powered vehicles. This test method describes operating and quality control procedures required to obtain data of known quality satisfying the requirements of either SAE J2719 or ISO 14687. This test method can be applied to other gaseous samples requiring determination of particulates provided the user's data quality objectives are satisfied.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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

D4150 Terminology Relating to Gaseous Fuels

D7650 Practice for Sampling of Particulate Matter in High Pressure Gaseous Fuels with an In-Stream Filter

¹ This test method is under the jurisdiction of ASTM Committee D03 on Gaseous Fuels and is the direct responsibility of Subcommittee D03.14 on Hydrogen and Fuel Cells.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

E617 Specification for Laboratory Weights and Precision Mass Standards

2.2 *SAE Standards:*³

SAE J2719 Hydrogen Quality Guideline for Fuel Cell Vehicles

2.3 *Other Standards:*

ISO 14687 Hydrogen fuel quality – Product specification⁴

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of general gaseous fuel terms used in this test method, refer to Terminology **D4150**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *weight monitoring filter, n*—this filter is put inside the glove box or clean room (7.3) with the balance (7.1) and never removed. The weight of this filter is always measured before and after each measurement event.

3.3 *Acronyms:*

3.3.1 *FCEV*—Fuel Cell Electric Vehicle

3.3.2 *HEPA*—High Efficiency Particulate Air

3.3.3 *PEMFC*—Proton Exchange Membrane Fuel Cell

3.3.4 *PTFE*—Polytetrafluoroethylene

3.3.5 *WMF*—Weight Monitoring Filter

4. Summary of Test Method

4.1 This test method is used to determine the concentration of particulate matter and nonvolatile residue on filters collected from hydrogen fuel or other gaseous streams at fueling station dispenser nozzles (Test Method **D7650**) or other gaseous fuel delivery system dispenser interfaces. The particulate concentration is determined by dividing the particulate weight, which is the difference of filter weights before and after sampling, by the total volume of hydrogen or other gaseous fuels passing through the filter. Every precaution should be taken to avoid

³ Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, <http://www.sae.org>.

⁴ Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case postale 56, CH-1211, Geneva 20, Switzerland, <http://www.iso.ch>.