



Designation: D7634 – 24

Standard Practice for Visualizing Particulate Sizes and Morphology of Particles Contained in Hydrogen Fuel by Microscopy¹

This standard is issued under the fixed designation D7634; 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 is intended for visualizing and measuring the sizes and morphology of particulates in hydrogen used as a fuel for fuel cell or internal combustion engine powered vehicles. This test method describes procedures required to obtain size and morphology data of known quality. This test method can be applied to other gaseous samples requiring determination of particulate sizes and morphology provided the user's data quality objectives are satisfied.

1.2 This practice describes procedures required to obtain size and morphology data of known quality.

1.3 This practice may be applied to other gaseous samples requiring the determination of particulate sizes and morphology provided the user's data quality objectives are satisfied.

1.4 Mention of trade names in the standard does not constitute endorsement or recommendation. Other manufacturers of equipment, software or equipment models may be used.

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

1.6 *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.*

1.7 *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.*

¹ This practice 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. 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

2.2 *SAE Standards:*³

SAE J2719 Hydrogen Quality Guideline for Fuel Cell Vehicles

2.3 *ISO Standards:*⁴

ISO 14687 Hydrogen fuel quality — Product specification

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of general terms used in D03 Gaseous Fuels standards, refer to Terminology D4150.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *HEPA Filter, n*—A high efficiency particulate air filter which, by definition, removes at least 99.97 % of airborne particles 0.3 μm in diameter.

3.3 *Acronyms:*

3.3.1 *HEPA*—High Efficiency Particulate Air

3.3.2 *PTFE*—Polytetrafluoroethylene

4. Summary of Practice

4.1 This procedure is for visualizing and measuring, by microscopy, the sizes and morphology of particulates after collection of particulates contained within hydrogen fuel at fueling station dispenser nozzles (Test Method D7650) or other gaseous fuel delivery system dispenser interfaces.

5. Significance and Use

5.1 The particulates in hydrogen fuel for fuel cell electric vehicles (FCEV) and gaseous hydrogen powered internal

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.

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), ISO Central Secretariat, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.