



Designation: D7923 – 19

Standard Test Method for Water in Ethanol and Hydrocarbon Blends by Karl Fischer Titration¹

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1. Scope*

1.1 This test method covers the determination of water in blends of ethanol, hydrocarbon, and corresponding blends. It is intended for measuring water content of gasoline or other hydrocarbon blendstock, denatured fuel ethanol as cited in Specification [D4806](#), and ethanol fuel blends such as those cited in Specification [D5798](#) and Practice [D7794](#). This test method is not applicable to samples that are phase separated.

1.1.1 *Procedure A*—For measurement of water from 0.004 % by mass to 1.63 % by mass in ethanol and hydrocarbon using coulometric Karl Fischer titration. This is the referee method for samples containing up to 1.63 % water.

1.1.2 *Procedure B*—For measurement of water from 0.02 % by mass to 5.41 % by mass in ethanol and hydrocarbon using volumetric Karl Fischer titration.

1.2 This method measures mass percent water and allows for the alternative reporting of volume percent. This test method recommends the use of pyridine-free reagents.

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

1.4 *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. Specific precautionary statements are given in Section 8.*

1.5 *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 test method is under the jurisdiction of ASTM Committee [D02](#) on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee [D02.06](#) on Analysis of Liquid Fuels and Lubricants.

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2. Referenced Documents

2.1 *ASTM Standards*:²

- [D1152](#) Specification for Methanol (Methyl Alcohol)
- [D1193](#) Specification for Reagent Water
- [D4057](#) Practice for Manual Sampling of Petroleum and Petroleum Products
- [D4175](#) Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants
- [D4177](#) Practice for Automatic Sampling of Petroleum and Petroleum Products
- [D4806](#) Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel
- [D5798](#) Specification for Ethanol Fuel Blends for Flexible-Fuel Automotive Spark-Ignition Engines
- [D6299](#) Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance
- [D6708](#) Practice for Statistical Assessment and Improvement of Expected Agreement Between Two Test Methods that Purport to Measure the Same Property of a Material
- [D7794](#) Practice for Blending Mid-Level Ethanol Fuel Blends for Flexible-Fuel Vehicles with Automotive Spark-Ignition Engines
- [E203](#) Test Method for Water Using Volumetric Karl Fischer Titration
- [E1064](#) Test Method for Water in Organic Liquids by Coulometric Karl Fischer Titration

3. Terminology

3.1 For general terminology, refer to Terminology [D4175](#).

3.2 *Definitions*:

3.2.1 *denatured fuel ethanol, n*—fuel ethanol made unfit for beverage use by the addition of denaturants under formula(s) approved by the applicable regulatory agency to prevent the imposition of beverage alcohol tax. **[D4806](#)**

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.

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