



Designation: D3343 – 22

Standard Test Method for Estimation of Hydrogen Content of Aviation Fuels¹

This standard is issued under the fixed designation D3343; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This test method covers the estimation of the hydrogen content (mass percent) of aviation gasolines and aircraft turbine and jet engine fuels.

1.2 This test method is empirical and is applicable to liquid hydrocarbon fuels that conform to the requirements of specifications for aviation gasolines or aircraft turbine and jet engine fuels of types Jet A, Jet A-1, Jet B, JP-4, JP-5, JP-7, and JP-8.

NOTE 1—The procedure for the experimental determination of hydrogen in petroleum fractions is described in Test Methods [D1018](#), [D3701](#), [D5291](#), and [D7171](#).

NOTE 2—The estimation of the hydrogen content of a hydrocarbon fuel is justifiable only when the fuel belongs to a well-defined class for which a relationship among the hydrogen content and the distillation range, density, and aromatic content has been derived from accurate experimental measurements on representative samples of that class. Even in this case, the possibility that the estimates may be in error by large amounts for individual fuels should be recognized. The fuels used to establish the correlation presented in this test method are defined by the following specifications:

Fuel	Specification
Aviation gasolines	D910
Aircraft turbine and jet engine fuels	
JP-4 and JP-5	MIL-DTL-5624
JP-7	MIL-DTL-38219
JP-8	MIL-DTL-83133
Jet A and Jet A-1	D1655
Miscellaneous hydrocarbons	
No. 2 Diesel fuel	
Kerosene distillates (similar to Jet A)	
Miscellaneous (includes thinners, gasoline fractions, and unidentified blends)	
Special production fuels (commercial products of nearly pure hydrocarbons and special high-temperature fuels (HTF) produced for Air Force tests.	
Pure hydrocarbons	

1.3 The values stated in SI units are to be regarded as the standard.

1.3.1 *Exception*—The values given in parentheses are for information only.

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.

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.*

2. Referenced Documents

2.1 ASTM Standards:²

- [D86 Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure](#)
- [D910 Specification for Leaded Aviation Gasolines](#)
- [D1018 Test Method for Hydrogen In Petroleum Fractions \(Withdrawn 2021\)³](#)
- [D1298 Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method](#)
- [D1319 Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption](#)
- [D1655 Specification for Aviation Turbine Fuels](#)
- [D2887 Test Method for Boiling Range Distribution of Petroleum Fractions by Gas Chromatography](#)
- [D3701 Test Method for Hydrogen Content of Aviation Turbine Fuels by Low Resolution Nuclear Magnetic Resonance Spectrometry](#)
- [D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants](#)
- [D5291 Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Petroleum Products and Lubricants](#)
- [D7171 Test Method for Hydrogen Content of Middle Distillate Petroleum Products by Low-Resolution Pulsed Nuclear Magnetic Resonance Spectroscopy](#)

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 [D02.04.0K](#) on Correlative Methods.

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

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