



Designation: D4625 – 16



Designation: 378/87

Standard Test Method for Middle Distillate Fuel Storage Stability at 43 °C (110 °F)¹

This standard is issued under the fixed designation D4625; 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 a method for evaluating the inherent storage stability of distillate fuels having flash points above 38 °C (100 °F), by Test Methods [D93](#), and 90 % distilled points below 340 °C (644 °F), by Test Method [D86](#).

NOTE 1—ASTM specification fuels falling within the scope of this test method are Specification [D396](#), Grade Nos. 1 and 2; Specification [D975](#), Grades 1-D and 2-D; and Specification [D2880](#), Grades 1-GT and 2-GT.

1.2 This test method is not suitable for quality control testing but, rather it is intended for research use to shorten storage time relative to that required at ambient storage temperatures.

1.3 [Appendix X1](#) presents additional information about storage stability and the correlation of Test Method D4625 results with sediment formation in actual field storage.

1.4 The values given in SI units are to be regarded as the standard.

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

1.5 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

[D86](#) Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure

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 [D02.14](#) on Stability and Cleanliness of Liquid Fuels.

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This test method was adopted as a joint ASTM/IP standard in 1986.

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.

[D93](#) Test Methods for Flash Point by Pensky-Martens Closed Cup Tester

[D381](#) Test Method for Gum Content in Fuels by Jet Evaporation

[D396](#) Specification for Fuel Oils

[D975](#) Specification for Diesel Fuel Oils

[D1193](#) Specification for Reagent Water

[D2880](#) Specification for Gas Turbine Fuel Oils

[D4057](#) Practice for Manual Sampling of Petroleum and Petroleum Products

[D4177](#) Practice for Automatic Sampling of Petroleum and Petroleum Products

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *adherent insolubles, n*—gums formed during storage that remain tightly attached to the walls of the vessel after fuel has been flushed from the container.

3.1.2 *filterable insolubles, n*—solids formed during storage that can be removed from the fuel by filtration.

3.1.3 *inherent storage stability, n*—of middle distillate fuel—the resistance of the fuel to change during storage in contact with air, but in the absence of other environmental factors such as water, or reactive metals and dirt.

3.1.4 *total insolubles, n*—the arithmetic sum of the filterable insolubles plus the adherent insolubles.

4. Summary of Test Method

4.1 Four-hundred (400) mL volumes of filtered fuel are aged by storage in borosilicate glass containers at 43 °C (110 °F) for periods of 4, 8, 12, 18, and 24 weeks. If desired, perform zero-week analyses on the same day as the other samples are placed in storage. Zero-week data are used to provide base data and ensure satisfactory technique. After aging for a selected time period, a sample is removed from storage, cooled to room temperature, and analyzed for filterable insolubles and for adherent insolubles.

5. Significance and Use

5.1 Fuel oxidation and other degradative reactions leading to formation of sediment (and color) are mildly accelerated by

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