



Standard Test Method for Determining Water Separation Characteristics of Aviation Turbine Fuels by Portable Separometer¹

This standard is issued under the fixed designation D 3948; 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 Department of Defense.

1. Scope

1.1 This test method provides a rapid portable means for field and laboratory use to rate the ability of aviation turbine fuels to release entrained or emulsified water when passed through fiberglass coalescing material.

1.2 The procedure section of this test method contains two different modes of test equipment operation. The primary difference between the modes of operation is the rate of fuel flow through the fiberglass coalescing material. Test method selection is dependent on the particular fuel to be tested.

1.3 The values stated in SI units are to be regarded as the standard. 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 and health practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see 7.2, 7.3, 7.4, and 10.3.

2. Referenced Documents

2.1 ASTM Standards:

- D 1655 Specification for Aviation Turbine Fuels²
- D 2550 Test Method for Water Separation Characteristics of Aviation Turbine Fuels²
- D 3602 Test Method for Water Separation Characteristics of Aviation Turbine Fuels³
- D 4306 Practice for Aviation Fuel Sample Containers for Tests Affected by Trace Contamination³

2.2 Military Standards: ⁴

- MIL-T-5624 (Grade MIL JP 4 and MIL JP 5) Turbine Fuel, Aviation Grade JP 4 and JP 5/JP 8 ST
- MIL-T-38219 (Grade MIL JP 7), Turbine Fuel, Low Volatility, JP-7
- MIL-T-83133 (Grade MIL JP 8) Turbine Fuel, Aviation, Kerosene Type, Grade JP 85 and NATO F 34 and F 35

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *micro separometer rating (MSEP)*—a numerical value indicating the ease of separating emulsified water from fuel by coalescence as affected by the presence of surface active materials (surfactants).

3.1.1.1 *Discussion*—MSEP ratings obtained using Test A and Test B are termed MSEP-A and MSEP-B, respectively. The MSEP rating is comparable to the Water Separometer Index, Modified (WSIM) and the Minisonic Separometer Surfactants (MSS) of Test Method D 2550 and field Test Method D 3602, respectively.

3.1.1.2 *Discussion*—The results of precision programs with the Micro-Separometer and its correlation with other rating methods (Test Methods D 2550 and D 3602) are discussed in Appendix X3.⁵

3.1.2 *reference fluids*—fuels that have been, as a minimum, clay treated and, as required, subjected to a water wash process and passed through a filter separator; and to which prescribed quantities of a known surface active agent (typically bis-2-ethylhexyl sodium sulfosuccinate in toluene) have been added.

4. Summary of Test Method

4.1 A water/fuel sample emulsion is created in a syringe using a high-speed mixer. The emulsion is then expelled from the syringe at a programmed rate through a standard fiber-glass coalescer and the effluent is analyzed for uncoalesced water by a light transmission measurement. The results are reported on a 0-to-100 scale to the nearest whole number. High ratings

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² *Annual Book of ASTM Standards*, Vol 05.01.

³ *Annual Book of ASTM Standards*, Vol 05.02.

⁴ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁵ A report of the data and conclusions are on file at ASTM Headquarters. Request RR:D02-1050.