



Designation: D8545 – 23^{ε1}

Standard Test Method for Determination of the Metal Deactivator Additive (MDA) (N,N'-disalicylidene-1,2-propanediamine) Content in Aviation Turbine Fuel by High Performance Liquid Chromatography (HPLC)¹

This standard is issued under the fixed designation D8545; 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.

^{ε1} NOTE—Editorially corrected 5.1 in February 2024.

1. Scope

1.1 This test method covers the determination of the metal deactivator additive (MDA) content of aviation turbine fuels. The specific MDA determined and used to develop this test method is N,N'-disalicylidene-1,2-propanediamine. Other MDAs have not been tested by this test method.

1.1.1 This test method specifically covers the determination of uncomplexed MDA content in aviation turbine fuel. MDA is a chelator of divalent metal ions, and the MDA-metal ion complexed species content of aviation turbine fuel will not be accounted for by this test method.

1.2 This test method is divided into two procedures: (1) Procedure A uses a semi-portable capillary-liquid chromatography system (Capillary-HPLC) that may be used in the field or laboratory; (2) Procedure B uses a standard laboratory version of liquid chromatography (Conventional-HPLC). Procedures A and B have separate precisions.

1.3 The test method has an interim repeatability determined in accordance with Practice D6300. Based on the mean values of the samples used in the interim repeatability study, Procedure A is applicable in the range of 0.50 mg/mL to 10.0 mg/mL; the range for Procedure B is 0.60 mg/mL to 9.6 mg/mL. Higher concentrations can be determined by dilution, but the precision of the test method has not been determined.

1.3.1 An extended interlaboratory study (ILS) will be conducted in the future to determine the full repeatability and reproducibility and the final applicable concentration ranges.

1.3.2 The test method applies to MDA in petroleum-based aviation fuels and Synthetic Aviation Fuels (SAF). However, for the interim precision, a petroleum-based aviation fuel was

used. Future ILS will include petroleum-based and SAFs. The test method is applicable to aviation fuels conforming to Specification D1655.

1.4 Appendix X2 indicates other additives that have been verified to not interfere with the analysis of this test method.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*

D1655 Specification for Aviation Turbine Fuels

D4052 Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter

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

D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance

D6300 Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products, Liquid Fuels, and Lubricants

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 D02.04.0C on Liquid Chromatography.

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