



Designation: D4740 – 24

# Standard Test Method for Cleanliness and Compatibility of Residual Fuels by Spot Test<sup>1</sup>

This standard is issued under the fixed designation D4740; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope\*

1.1 This test method covers separate procedures for determining the cleanliness of residual fuel oil and the compatibility of a residual fuel oil with a blend stock. It is applicable to residual fuel oils with viscosities up to 50 cSt (1 cSt = 1 mm<sup>2</sup>/s) at 100 °C. This test method describes two protocols: one manual and one automated.

NOTE 1—This test method has not been evaluated for heavy distillate having the propensity to leave a wax sediment on the filter paper and contain no residual asphaltene.

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

1.3 *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.*

1.4 *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:<sup>2</sup>

- 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

<sup>1</sup> 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, Cleanliness and Compatibility of Liquid Fuels.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [www.astm.org/contact](http://www.astm.org/contact). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

## D4870 Test Method for Determination of Total Sediment in Residual Fuels

### 2.2 ASTM Adjuncts:<sup>3</sup>

Reference Spot Sheet

## 3. Terminology

3.1 For definitions of terms used in this standard, see Terminology D4175.

### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *blend stock, n*—one component or more components used to make a final fuel product.

3.2.1.1 *Discussion*—In heavy fuel oils, blend stocks include various refinery streams ranging from kerosine to heavy distillates, residuals, and asphalts.

3.2.2 *cleanliness, n*—of residual fuel, the concentration of suspended solids in a finished sample.

3.2.2.1 *Discussion*—The lower the concentration of suspended solids, the cleaner the residual fuel.

3.2.3 *compatibility, n*—of residual fuel, the absence of suspended solids when equal volumes of a sample and a blend stock are mixed together.

## 4. Summary of Test Method

4.1 *Cleanliness Procedures, Manual and Automated*—A drop of the preheated and thoroughly mixed sample is put on a test paper and placed in an oven at 100 °C. After 1 h, the test paper is removed from the oven and the resultant spot is examined for evidence of suspended solids and rated for cleanliness using the D4740 Adjunct Reference Spot Sheet.<sup>3</sup>

4.2 *Compatibility Procedures, Manual and Automated*—A blend composed of equal volumes of the sample fuel oil and the blend stock is tested in the same way as described in 4.1 and rated for compatibility against D4740 Adjunct Reference Spot Sheet.<sup>3</sup>

## 5. Significance and Use

5.1 The four procedures in this test method are used alone or in combination to identify fuels or blends that could result in

<sup>3</sup> Available from ASTM International Headquarters. Order Adjunct No. ADJD474023. The original adjunct produced in 2000 was updated in 2023. It is encouraged to use new adjunct (see Appendix X1).

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