



Standard Test Method for Free Water and Particulate Contamination in Distillate Fuels (Visual Inspection Procedures)¹

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

1. Scope

1.1 This test method covers two procedures for estimating the presence of suspended free water and solid particulate contamination in distillate fuels having distillation end points below 400°C and an ASTM color of 5 or less.

1.1.1 Both procedures are intended for use as field tests at storage temperatures.

1.1.2 Procedure 1 provides a rapid pass/fail method for contamination. Procedure 2 provides a gross numerical rating of haze appearance.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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

2. Referenced Documents

2.1 ASTM Standards:

- D 1500 Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)²
- D 1744 Test Method for Water in Liquid Petroleum Products by Karl Fischer Reagent²
- D 2276 Test Methods for Particulate Contaminant in Aviation Turbine Fuels³
- D 2709 Test Method for Water and Sediment in Distillate Fuels by Centrifuge³
- D 4057 Practice for Manual Sampling of Petroleum and Petroleum Products⁴
- D 4860 Test Method for Free Water and Particulate Contamination in Mid-Distillate Fuels (Clear and Bright Numerical Rating)⁴

2.2 ASTM Adjuncts:

Distillate Fuel Bar Chart⁵

Distillate Fuel Haze Rating Standard⁶

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *free water*—water in excess of that soluble in the fuel at the temperature of the test, and appearing in the fuel as a haze or cloudiness, or as droplets.

3.1.2 *solid particulates*—small solid or semisolid particles, sometimes referred to as silt or sediment, present in a fuel as a result of contamination by air-blown dusts, corrosion by-products, fuel instability, or protective-coating deterioration.

3.1.3 *clear-and-bright* (also termed “clean-and-bright”)—a condition in which the fuel contains no visible water drops or particulates, and is free of haze or cloudiness.

4. Summary of Test Method

4.1 In Procedure 1 approximately 900 mL of fuel is placed into a clear glass, one litre jar and is examined visually for clarity. The sample is then swirled and examined for visual sediment or water drops below the vortex.

4.2 In Procedure 2 approximately 900 mL of fuel is placed into a clear glass, one litre jar and is examined visually for clarity. Fuel clarity is rated by placing a standard bar chart behind the sample and comparing its visual appearance with the standard haze rating photos. The sample is then swirled and examined for visual sediment or water drops below the vortex.

4.3 Both Procedure 1 and 2 are performed immediately after sampling and at storage temperature conditions.

5. Significance and Use

5.1 It has long been the practice to include in fuel specifications a requirement that the fuel be *clear and bright and free of visible particulate matter* (see Note 1). However, there has been no standard method for making this determination so that practices have differed. This test method provides standard procedures for the test.

NOTE 1—*Clean and bright* is sometimes used in place of *clear and bright*. The meaning is identical.

5.2 Procedure 1 provides a rapid pass/fail method for

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

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

⁴ *Annual Book of ASTM Standards*, Vol 05.03.

⁵ Available from ASTM Headquarters. Request Adjunct No. ADJD417601.

⁶ Available from ASTM Headquarters. Request Adjunct No. ADJD417602.