



Standard Test Method for Determination of the Red Dye Concentration and Estimation of the ASTM Color of Diesel Fuel and Heating Oil Using a Portable Visible Spectrophotometer¹

This standard is issued under the fixed designation D6756; 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.

1. Scope

1.1 This test method covers the determination of the red dye concentration of diesel fuel and heating oil and the estimation of the ASTM color of undyed and red-dyed diesel fuel and heating oil. The test method is appropriate for use with diesel fuel and heating oil of Grades 1 and 2 described in Specifications [D396](#), [D975](#), [D2880](#) and [D3699](#). Red dye concentrations are determined at levels equivalent to 0.1 mg/L to 20 mg/L of Solvent Red 26 in samples with ASTM colors ranging from 0.5 to 5. The ASTM color of the base fuel of red-dyed samples with concentration levels equivalent to 0.1 mg/L to 20 mg/L of Solvent Red 26 is estimated for the ASTM color range from 0.5 to 5. The ASTM color of undyed samples is estimated over the ASTM color range of 0.5 to 5.

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

2. Referenced Documents

2.1 ASTM Standards:²

[D396](#) Specification for Fuel Oils

[D975](#) Specification for Diesel Fuel Oils

[D1500](#) Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)

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

[D3699](#) Specification for Kerosine

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 [D02.05](#) on Properties of Fuels, Petroleum Coke and Carbon Material.

Current edition approved Oct. 1, 2015. Published December 2015. Originally approved in 2002. Last previous edition approved in 2010 as D6756 – 10. DOI: 10.1520/D6756-10R15.

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.

[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

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

[D6045](#) Test Method for Color of Petroleum Products by the Automatic Tristimulus Method

[D6708](#) Practice for Statistical Assessment and Improvement of Expected Agreement Between Two Test Methods that Purport to Measure the Same Property of a Material

[E203](#) Test Method for Water Using Volumetric Karl Fischer Titration

[E1655](#) Practices for Infrared Multivariate Quantitative Analysis

[E2056](#) Practice for Qualifying Spectrometers and Spectrophotometers for Use in Multivariate Analyses, Calibrated Using Surrogate Mixtures

3. Terminology

3.1 Definitions:

3.1.1 *ASTM color, n*—the name of an empirical scale of expressing the color of a petroleum liquid darker than Saybolt color based on a scale of 0.5 (lightest) to 8 Dil (darkest) and determined by Test Method [D1500](#).

3.1.2 *surrogate calibration, n*—a multivariate calibration that is developed using a calibration set which consists of mixtures with pre-specified and reproducible compositions that contain substantially fewer chemical components than the samples which will ultimately be analyzed. **E2056**

3.1.3 *surrogate method, n*—a standard test method that is based on a surrogate calibration. **E2056**

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *red dye, n*—substance that, when added to fuel, absorbs green light and imparts a red color to the product. For this test method, red dyes are:

3.2.1.1 *product dyes, n*—alkyl derivatives of azobenzene-4-azo-2-naphthol (methyl derivatives of Color Index No. 26105) which are more soluble in diesel fuel.