



Standard Test Method for Determination of the Red Dye Concentration and Estimation of Saybolt Color of Aviation Turbine Fuels and Kerosine Using a Portable Visible Spectrophotometer¹

This standard is issued under the fixed designation D7058; 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 aviation turbine fuel and kerosine and the estimation of the Saybolt color of undyed and red dyed (<0.750 mg/L of Solvent Red 26 equivalent) aviation turbine fuel and kerosine. The test method is appropriate for use with aviation turbine fuel and kerosine described in Specifications [D1655](#) and [D3699](#). Red dye concentrations are determined at levels equivalent to 0.026 to 0.750 mg/L of Solvent Red 26 in samples with Saybolt colors ranging from +30 to –16. The Saybolt color of the base fuel for samples dyed red with concentration levels equivalent to 0.026 to 0.750 mg/L of Solvent Red 26 is estimated in the Saybolt Color range +30 to –16. The Saybolt Color for undyed samples is estimated in the Saybolt color range from +30 to –16.

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

- [D156](#) Test Method for Saybolt Color of Petroleum Products (Saybolt Chromometer Method)
- [D1319](#) Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption
- [D1655](#) Specification for Aviation Turbine Fuels

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.

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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.

[D3699](#) Specification for Kerosine

[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

[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 *Saybolt color, n*—an empirical definition of the color of a clear petroleum liquid based on a scale of –16 to +30 and determined by Test Method [D156](#).

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.

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

3.2 Definitions of Terms Specific to This Standard:

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

3.2.2 *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 dye is:

3.2.2.1 *Solvent Red 26*—an azobenzene-4-azo-2-naphthol dye of a specific chemical structure that is used to gauge the amount of red dye present in a given sample.