



Designation: D5386 – 24

Standard Test Method for Color of Liquids Using Tristimulus Colorimetry¹

This standard is issued under the fixed designation D5386; 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 an instrumental method for the CIE (Commission International de l'Eclairage) tristimulus measurement of the color of near-clear liquid samples. The transmission measurement values are converted to the color scale in the platinum-cobalt (Pt-Co) system.

1.2 This test method has been found applicable to the color measurement of clear, liquid samples, free of haze, with nominal Pt-Co color values in the 0 to 100 range. It is applicable to non-fluorescent liquids with light absorption characteristics similar to those of the Pt-Co color standard solutions.

1.3 The tristimulus colorimetry may be calculated from spectral measurements or be obtained directly from a colorimeter. Practice E1455 provides some guidance on colorimeters, while Test Methods D1686 and D2108 deal with the visual and instrumental measurement of near-clear liquids.

1.4 In determining the conformance of the test results using this method to applicable specifications, results shall be rounded in accordance with the rounding off methods of Practice E29.

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:²

D1193 Specification for Reagent Water

D1686 Test Method for Color of Solid Aromatic Hydrocarbons and Related Materials in the Molten State (Platinum-Cobalt Scale)

D2108 Test Method for Color of Halogenated Organic Solvents and Their Admixtures (Platinum-Cobalt Scale)

D3437 Practice for Sampling and Handling Liquid Cyclic Products

D6809 Guide for Quality Control and Quality Assurance Procedures for Aromatic Hydrocarbons and Related Materials

D8005 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E179 Guide for Selection of Geometric Conditions for Measurement of Reflection and Transmission Properties of Materials

E308 Practice for Computing the Colors of Objects by Using the CIE System

E313 Practice for Calculating Yellowness and Whiteness Indices from Instrumentally Measured Color Coordinates

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E1455 Practice for Obtaining Colorimetric Data from a Visual Display Unit Using Tristimulus Colorimeters

2.2 Other Document:

OSHA Regulations, 29 CFR paragraphs 1910.1000 and 1910.1200³

3. Summary of Test Method

3.1 The color of a liquid sample is measured as the difference between the tristimulus values for the light transmitted through the sample minus the tristimulus values for the

¹ This test method is under the jurisdiction of ASTM Committee D16 on Aromatic, Industrial, Specialty and Related Chemicals and is the direct responsibility of Subcommittee D16.04 on Instrumental Analysis.

Current edition approved May 1, 2024. Published May 2024. Originally approved in 1993. Last previous edition approved in 2016 as D5386 – 16. DOI: 10.1520/D5386-24.

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.

³ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

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