Designation: D 5386 – 04

Standard Test Method for Color of Liquids Using Tristimulus Colorimetry[1]

This standard is issued under the fixed designation D 5386; 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 measurement is converted to color ratings in the platinum-cobalt system.

1.2 This test method has been found applicable to the color measurement of clear, liquid samples, free of haze, with nominal platinum cobalt color values in the 0 to 30 range. It is applicable to nonfluorescent liquids with light absorption characteristics similar to those of the platinum cobalt color standard solutions. Test Methods D 1686, D 2108, and E 450 deal with the visual and instrumental measurement of near-clear liquids.

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]

D 1193 Specification for Reagent Water

D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)

D 1686 Test Method for Color of Solid Aromatic Hydrocarbons and Related Materials in the Molten State (Platinum-Cobalt Scale)

D 2108 Test Method for Color of Halogenated Organic Solvents and Their Admixtures (Platinum-Cobalt Scale)

D 3437 Practice for Sampling and Handling Liquid Cyclic Products

E 179 Guide for Selection of Geometric Conditions for Measurement of Reflection and Transmission Properties of Materials

E 308 Practice for Computing the Colors of Objects by Using the CIE System

E 313 Practice for Calculating Yellowness and Whiteness Indices from Instrumentally Measured Color Coordinates

E 450 Method for Measurement of Color of Low-Colored Clear Liquids Using the Hunterlab Color Difference Meter[3]

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of Test Methods

2.2 *Other Document:*

OSHA Regulations, 29 CFR, paragraphs 1910.1000 and 1910.1200[4]

3. Summary of Test Method

3.1 Color is measured by tristimulus values of light transmitted by a sample as percent of light transmitted by distilled water. Convert the measured tristimulus values by appropriate equations to the platinum-cobalt scale.

4. Significance and Use

4.1 The major objective of the visual platinum-cobalt (Pt-Co) method of color measurement, as defined in Test Method D 1209, is to rate specific materials for yellowness. This yellowness is frequently the result of the undesirable tendency of liquid hydrocarbons to absorb blue light due to contamination in processing, storage or shipping.

4.2 Clear liquids can be rated for light absorbing yellowish or brownish contaminants, using scales that simulate the long-established visual-comparison method just cited. Where needed, dimensions of color can be reported to identify any pinkness or greenness (one dimension), or grayness.

5. Apparatus

5.1 *Instrument*, with the following provisions:

5.1.1 *Instrument Sensor*, shall provide a beam for illuminating the sample cell in transmission. The instrument shall be capable of converting light measured in total transmission through the sample cell to CIE X Y Z tristimulus color values for the measurement conditions of CIE illuminant C and the CIE 1931 2 degree standard observer as described in Guide E 179 and Practice E 308.

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

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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.

[3] Withdrawn.

[4] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

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

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