



Designation: D 5386 – 93b (Reapproved 2000)^{ε1}

Standard Test Method for Color of Liquids Using Tristimulus Colorimetry¹

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^{ε1} NOTE—Editorial changes made throughout in March 2000.

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:

- D 1193 Specification for Reagent Water²
- D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)³
- D 1686 Test Method for Color of Solid Aromatic Hydrocarbons and Related Materials in the Molten State (Platinum-Cobalt Scale)³
- D 1925 Test Method for Yellowness Index of Plastics⁴
- D 2108 Test Method for Color of Halogenated Organic Solvents and Their Admixtures (Platinum-Cobalt Scale)⁵
- D 3437 Practice for Sampling and Handling Liquid Cyclic Products³

E 179 Guide for Selection of Geometric Conditions for Measurement of Reflectance and Transmission Properties of Materials⁶

E 308 Practice for Computing the Colors of Objects by Using the CIE System⁶

E 450 Method for Measurement of Color of Low-Colored Clear Liquids Using the Hunterlab Color Difference Meter⁷

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of Test Methods⁸

2.2 Other Document:

OSHA Regulations, 29 CFR, paragraphs 1910.1000 and 1910.1200⁹

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

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 *Annual Book of ASTM Standards*, Vol 11.01.

³ *Annual Book of ASTM Standards*, Vol 06.04.

⁴ *Annual Book of ASTM Standards*, Vol 08.01.

⁵ *Annual Book of ASTM Standards*, Vol 15.05.

⁶ *Annual Book of ASTM Standards*, Vol 06.01.

⁷ Discontinued 1993; see 1992 *Annual Book of ASTM Standards*, Vol. 15.05.

⁸ *Annual Book of ASTM Standards*, Vol 14.02.

⁹ Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.