Designation: D1544 – 04 (Reapproved 2018)

Standard Test Method for Color of Transparent Liquids (Gardner Color Scale)[1]

This standard is issued under the fixed designation D1544; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This test method covers the measurement of the color of transparent liquids by means of comparison with arbitrarily numbered glass standards.

1.2 Users of this method should have normal color vision.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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.*

1.5 *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]

D1545 Test Method for Viscosity of Transparent Liquids by Bubble Time Method

D6166 Test Method for Color of Pine Chemicals and Related Products (Instrumental Determination of Gardner Color)

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

3. Significance and Use

3.1 This test method applies to drying oils, varnishes, fatty acids, polymerized fatty acids, and resin solutions. Its application to other materials has not been tested.

4. Apparatus

4.1 *Glass Standards,* 18, numbered separately, and having the color characteristics given in Table 1. The color shall be produced by the glass components only. Some glass standards in use today do not conform to the values reported in Table 1. The calibration of glass standards should be verified prior to use; a suitable procedure for their calibration is contained in Appendix X1.

4.2 *Glass Tubes,* clear, 10.65 mm in inside diameter and about 114 mm in outside length. (Viscosity tubes, as described in Test Method D1545, are satisfactory.)

4.3 Suitable apparatus for comparing sample and standard. The apparatus may be of any design, but should have the following characteristics:

4.3.1 *Illumination*—CIE Illuminant C.

4.3.2 *Surrounding Field*—The field should be black.

4.3.3 *Field of View*—The specimen and one or more standards should subtend a visual angle of about 2° and be in the field of view simultaneously.

4.3.4 *Separation of Standard and Specimen*—There should be a perceptible separation between specimen and standard, but this should be as small as is mechanically possible.

5. Procedure

5.1 Fill a glass tube with the material under test. If the material is perceptibly cloudy, first filter it.

5.2 Compare with glass standards, determining which standard most closely matches the specimen in brightness and saturation. Ignore hue differences.

6. Report

6.1 Report the color as the number of the standard most closely matching the specimen. If more precise measurements are needed, report as either matching a standard or lighter or darker. Thus, between colors 5 and 6, the steps will be 5, 5+, 6–, and 6.

[1] This test method is under the jurisdiction of Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.26 on Optical Properties.

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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.