Designation: C 1510 – 01

Standard Test Method for Color and Color Difference of Whitewares by Abriged Spectrophotometry[1]

This standard is issued under the fixed designation C 1510; 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 describes the instrumental measurement of the reflection properties and color of ceramic glazes and other whitewares by the use of a spectrophotometer or spectrocolorimeter with a hemispherical optical measuring system, such as an integrating sphere.

1.2 The test method is suitable for use with most specimens having an exterior flat surface large enough to cover the spectrophotometer sample port.

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:*

C 242 Terminology of Ceramic Whitewares and Related Products[2]

D 2244 Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates[3]

E 179 Guide for Selection of Geometric Conditions for Measurement of Reflection and Transmission Properties of Materials[3]

E 284 Terminology of Appearance [3]

E 308 Practice for Computing the Colors of Objects by Using the CIE System[3]

E 805 Practice for Identification of Instrumental Methods of Color or Color-Difference Measurement of Materials[3]

E 1164 Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation[3]

E 1331 Test Method for Reflectance Factor and Color by Spectrophotometry Using Hemispherical Geometry[2]

3. Terminology

3.1 *Definitions*:

3.1.1 The definitions in Guide E 179, Terminologies C 242 and E 284, and Practice E 1164 are applicable to this test method.

4. Summary of Test Method

4.1 This test method provides a procedure for measuring the reflectance factors of reflecting ceramic glazes or related whiteware specimens by using a spectrophotometer or spectrocolorimeter equipped with a hemispherical optical measuring system such as an integrating sphere. (See Test Method E 1331.)

4.2 This test method includes procedures for calibrating the instrument and for selecting specimens suitable for precision measurement.

4.3 Most modern spectrophotometers have the capacity to compute the color coordinates of the specimen immediately following the measurement. When this is the case, the user must select the color system, observer, and illuminant (Practice E 308, Section 6).

5. Significance and Use

5.1 The most direct and accessible methods for obtaining the color coordinates of ceramic glazes and related whitewares are by instrumental measurement using spectrophotometers or colorimeters with either hemispherical or bidirectional optical measuring systems. This test method provides procedures for such measurement by reflectance spectrophotometry using a hemispherical optical measuring system.

5.2 This test method is especially suitable for measurement of the following types of specimens for the indicated uses(See Practice E 805.):

5.2.1 All types of ceramic glaze and related whiteware specimens to obtain data for use in computer colorant formulation.

5.2.2 Ceramic glaze and related whiteware specimens for color assessment.

5.2.2.1 For the measurement of plane-surface high-gloss specimens, the specular component should generally be excluded during the measurement.

5.2.2.2 For the measurement of plane-surface intermediate-gloss (satin) specimens, where the first-surface reflection component may be distributed over a wide range of angles,

[1] This test method is under the jurisdiction of ASTM Committee C21 on Ceramic Whitewares and Related Productsand is the direct responsibility of Subcommittee C21.03on Test Methods for Whiteware Properties.

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[2] *Annual Book of ASTM Standards*, Vol 15.02.

[3] *Annual Book of ASTM Standards*, Vol 06.01.