



Designation: C1510 – 01 (Reapproved 2016)

# Standard Test Method for Color and Color Difference of Whitewares by Abridged Spectrophotometry<sup>1</sup>

This standard is issued under the fixed designation C1510; 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 ( $\epsilon$ ) 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 spectrophotometer 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:*<sup>2</sup>

[C242 Terminology of Ceramic Whitewares and Related Products](#)

[D2244 Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates](#)

[E179 Guide for Selection of Geometric Conditions for Measurement of Reflection and Transmission Properties of Materials](#)

[E284 Terminology of Appearance](#)

[E308 Practice for Computing the Colors of Objects by Using the CIE System](#)

[E805 Practice for Identification of Instrumental Methods of Color or Color-Difference Measurement of Materials](#)

[E1164 Practice for Obtaining Spectrometric Data for Object-Color Evaluation](#)

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee C21 on Ceramic Whitewares and Related Products and is the direct responsibility of Subcommittee C21.03 on Methods for Whitewares and Environmental Concerns.

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<sup>2</sup> 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.

[E1331 Test Method for Reflectance Factor and Color by Spectrophotometry Using Hemispherical Geometry](#)

## 3. Terminology

3.1 *Definitions:*

3.1.1 The definitions in Guide E179, Terminologies C242 and E284, and Practice E1164 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 spectrophotometer equipped with a hemispherical optical measuring system such as an integrating sphere. (See Test Method E1331.)

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 E308, 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 E805.):

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.