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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Practice for Obtaining Spectroradiometric Data from Radiant Sources for Colorimetry¹

This standard is issued under the fixed designation E 1341; 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.

INTRODUCTION

The fundamental procedure for characterizing the color and absolute luminance of radiant sources is to obtain the spectroradiometric data under specified measurement conditions, and from these data to compute CIE chromaticity coordinates and luminance values based on the CIE 1931 Standard Observer. The considerations involved and the procedures to be used to obtain precision spectroradiometric data for this purpose are contained in this practice. The values and procedures for computing CIE chromaticity coordinates are contained in Method E 308. This practice includes minor modifications to the procedures given in Method E 308 that are necessary for computing the absolute luminance of radiant sources.

1. Scope

1.1 This practice prescribes the instrumental measurement requirements, calibration procedures, and physical standards needed for precise spectroradiometric data for characterizing the color and luminance of radiant sources.

1.2 This practice lists the parameters that must be specified when spectroradiometric measurements are required in specific methods, practices, or specifications.

1.3 This practice describes the unique calculation procedures required to determine basic colorimetric data of luminous sources.

1.4 This practice is general in scope rather than specific as to instrument, object, or material.

1.5 The values stated in SI units are to be regarded as the standard.

1.6 *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:

E 275 Practice for Describing and Measuring Performance

of Ultraviolet, Visible, and Near-Infrared Spectrophotometers²

E 284 Terminology Relating to Appearance³

E 308 Practice for Computing the Colors of Objects by Using the CIE System³

E 387 Test Method for Estimating Stray Radiant Power Ratio of Spectrophotometers by the Opaque Filter Method²

E 925 Practice for the Periodic Calibration of Narrow Band-Pass Spectrophotometers²

E 958 Practice for Measuring Practical Spectral Bandwidth of Ultraviolet-Visible Spectrophotometers²

2.2 NIST Publications:

NIST Technical Note 594-1 Fundamental Principles of Absolute Radiometry and the Philosophy of the NBS Program (1968–1971)⁴

NIST Technical Note 594-3 Photometric Calibration Procedures⁴

2.3 CIE Publications:

Publication CIE No. 15.2 Colorimetry, 2nd ed., 1986⁵

Publication CIE No. 38 Radiometric and Photometric Characteristics of Materials and their Measurement, 1977⁵

Publication CIE No. 63 Spectroradiometric Measurement of Light Sources, 1984⁵

2.4 IES Standard:

² Annual Book of ASTM Standards, Vol 03.06.

³ Annual Book of ASTM Standards, Vol 06.01.

⁴ Available from National Institute of Standards and Technology (NIST), Gaithersburg, MD 20899-0001.

⁵ Currently available through the U.S. National Committee of the CIE, c/o Mr. Thomas M. Lemons, TLA-Lighting Consultants, Inc., 7 Pond Street, Salem, MA 01970-4819.

¹ This test method is under the jurisdiction of ASTM Committee E-12 on Appearance and is the direct responsibility of Subcommittee E12.06 on Appearance of Displays.

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