



Designation: E2214 – 17

Standard Practice for Specifying and Verifying the Performance of Color- Measuring Instruments¹

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INTRODUCTION

Recent advances in optics, electronics and documentary standard have resulted in a proliferation of instruments for the measurement of color and appearance of materials and objects. These instruments possess very good performance but there has been little progress toward standardizing the terminology and procedures to quantify that performance. Therefore, the commercial literature and even some documentary standards are a mass of confusing terms, numbers and specifications that are impossible to compare or interpret.

Two recent papers in the literature, have proposed terms and procedures to standardize the specification, comparison and verification of the level of performance of a color-measuring instrument.^{2,3} Following those procedures, those specifications can be compared to product tolerances. This becomes important so that instrument users and instrument makers can agree on how to compare or verify, or both, that their instruments are performing in the field as they were designed and tested in the factory.

1. Scope

1.1 This practice provides standard terms and procedures for describing and characterizing the performance of spectral and filter based instruments designed to measure and compute the colorimetric properties of materials and objects. It does not set the specifications but rather gives the format and process by which specifications can be determined, communicated and verified.

1.2 This practice does not describe methods that are generally applicable to visible-range spectroscopic instruments used for analytical chemistry (UV-VIS spectrophotometers). ASTM Committee E13 on Molecular Spectroscopy and Chromatography includes such procedures in standards under their jurisdiction.

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.*

1.4 *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:*⁴

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

[E284 Terminology of Appearance](#)

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

¹ This practice is under the jurisdiction of ASTM Committee E12 on Color and Appearance and is the direct responsibility of Subcommittee E12.04 on Color and Appearance Analysis.

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² Ladson, J., "Colorimetric Data Comparison of Bench-Top and Portable Instruments," *AIC Interim Meeting, Colorimetry*, Berlin, 1995.

³ Rich, D., "Standardized Terminology and Procedures for Specifying and Verifying the Performance of Spectrocolorimeters," *AIC Color 97 Kyoto*, Kyoto, 1997.

⁴ 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.