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Standard Guide to Evaluation of Optical Properties of Powder Coatings¹

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INTRODUCTION

The term optical properties of powder coatings refers to those properties associated with the interaction of visible light with the coatings. These properties include, but are not limited to, color, color difference, gloss, and metamerism. Coating powder users and producers may sometimes be overwhelmed by the sheer number of standard practices and standard test methods available for the evaluation of the optical properties of the finished coatings.

This guide is intended to lead the user to each of the practices and test methods needed, once the user decides whether the evaluation is to be by visible means or by instrumental means. Further, the user must decide which of the several optical properties mentioned above are to be evaluated. This guide will lead the user to the applicable practices and test methods for the properties chosen by the means selected.

1. Scope

1.1 This standard provides the user with a guide to the various available practices and test methods for the evaluation of color, color difference, gloss, and metamerism by both visual and by instrumental means.

1.2 *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.*

1.3 *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

[D523 Test Method for Specular Gloss](#)

[D1535 Practice for Specifying Color by the Munsell System](#)

[D1729 Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials](#)

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

[D2616 Test Method for Evaluation of Visual Color Difference With a Gray Scale](#)

[D3134 Practice for Establishing Color and Gloss Tolerances](#)

[D4039 Test Method for Reflection Haze of High-Gloss Surfaces](#)

[D4086 Practice for Visual Evaluation of Metamerism](#)

[D4449 Test Method for Visual Evaluation of Gloss Differences Between Surfaces of Similar Appearance](#)

[D5767 Test Methods for Instrumental Measurement of Distinctness-of-Image Gloss of Coating Surfaces](#)

[E284 Terminology of Appearance](#)

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

[E430 Test Methods for Measurement of Gloss of High-Gloss Surfaces by Abridged Goniophotometry](#)

[E1247 Practice for Detecting Fluorescence in Object-Color Specimens by Spectrophotometry](#)

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

[E1345 Practice for Reducing the Effect of Variability of Color Measurement by Use of Multiple Measurements](#)

[E1347 Test Method for Color and Color-Difference Measurement by Tristimulus Colorimetry](#)

[E1349 Test Method for Reflectance Factor and Color by Spectrophotometry Using Bidirectional \(45°:0° or 0°:45°\) Geometry](#)

¹ This guide is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.51 on Powder Coatings.

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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.