



Designation: D2805 – 11 (Reapproved 2018)

## Standard Test Method for Hiding Power of Paints by Reflectometry<sup>1</sup>

This standard is issued under the fixed designation D2805; 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.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

### INTRODUCTION

Using equations derived from Kubelka-Munk turbid media theory **(1-4)**<sup>2</sup> (see **Annex A1**), the reflectance of a coating can be predicted for any film thickness from measurements made at only one. On this basis several rapid and accurate test methods **(5, 6)** have been developed for determining hiding power. In the past such test methods have been considered difficult due to complexities, apparent and actual, in the treatment of data. The present test method has been simplified in this respect, primarily by adapting it fully for computer calculations.

Although the use of broad-band reflectometry makes this test method theoretically valid only for nonchromatic (white or gray) colors, good agreement has been obtained with chromatic paints as well. This is undoubtedly because the experimental measurements are made fairly close to the hiding power end point so that the Kubelka-Munk extrapolation and thus any associated error is relatively small.

This test method is therefore recommended without restriction as to color.

### 1. Scope

1.1 This test method covers the determination, without reference to a material paint standard, of the hiding power of air dry coatings with *Y tristimulus values greater than 15 %*. *With appropriate modification, it can also be used to test baking finishes.*

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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, health, and environmental 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*:<sup>3</sup>

**D344** Test Method for Relative Hiding Power of Paints by the Visual Evaluation of Brushouts

**D1475** Test Method for Density of Liquid Coatings, Inks, and Related Products

**D3924** Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials (Withdrawn 2016)<sup>4</sup>

**E284** Terminology of Appearance

**E1247** Practice for Detecting Fluorescence in Object-Color Specimens by Spectrophotometry

**E1331** Test Method for Reflectance Factor and Color by Spectrophotometry Using Hemispherical Geometry

**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

### 3. Terminology

3.1 *Definitions*—For definitions used in this test method, see Terminology **E284**.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee **D01** on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee **D01.26** on Optical Properties.

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<sup>2</sup> The boldface numbers in parentheses refer to the list of references at the end of this standard.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>4</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).