



Standard Test Method for Hiding Power of Paints by Reflectometry¹

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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)**² (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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:³

¹ 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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² The boldface numbers in parentheses refer to the list of references at the end of this standard.

³ 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.

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 Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials
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**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *contrast ratio, n*—the ratio of the reflectance of a film on a black substrate to that of an identical film on a white substrate.