



Designation: D6441 – 05 (Reapproved 2024)

Standard Test Methods for Measuring the Hiding Power of Powder Coatings¹

This standard is issued under the fixed designation D6441; 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.

1. Scope

1.1 These test methods determine and report the hiding power of a powder coating with respect to two parameters:

1.1.1 Test Method A—Contrast Ratio at a given film thickness

1.1.2 Test Method B—Film thickness at 0.98 (98 %) contrast ratio.

NOTE 1—The measured parameters follow powder coating industry practice by measuring hiding power in relation to film thickness, rather than the “Spreading Rate” function employed in Test Methods D344 and D2805 and other hiding power test methods.

NOTE 2—Hiding power is photometrically defined as the spreading rate at 0.98 contrast ratio. See definitions of spreading rate and hiding power in Terminology D16, D2805, and the *Paint and Coatings Testing Manual*.

NOTE 3—The contrast ratio 0.98 is conventionally accepted in the coatings industry as representing “complete” hiding for reflectometric hiding power measurements. But visually, as well as photometrically, it is slightly less than complete.

1.2 These test methods cover the determination of the hiding power of powder coatings applied by electrostatic spraying.

1.3 These test methods determine hiding power by means of reflectometric and thickness gauge measurements. They are limited to coatings having a minimum CIE-Y reflectance of 15 %.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 *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.*

1.6 *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 Recom-*

mendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 *ASTM Standards:*²

D16 Terminology for Paint, Related Coatings, Materials, and Applications

D344 Test Method for Relative Hiding Power of Paints by the Visual Evaluation of Brushouts (Withdrawn 2018)³

D2805 Test Method for Hiding Power of Paints by Reflectometry

D3451 Guide for Testing Coating Powders and Powder Coatings

E284 Terminology of Appearance

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

2.2 *Other Standard:*

1-GP-71 Method 14.7, Hiding Power, Contrast Ratio Method, October 1982⁴

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *reflectance, n*—term of wide applicability, referring herein to the *luminous reflectance factor* as defined in Terminology E284, and equivalent to the CIE Tristimulus value *Y* measured in accordance with Test Methods E1331, E1347 or Test Method E1349 with specular reflection excluded. It is expressed as a percentage in this standard.

3.1.2 *white substrate, n*—For purposes of this test, a substrate of neutral shade with a minimum reflectance of 78 %.

¹ These test methods are under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.51 on Powder Coatings.

Current edition approved Feb. 1, 2024. Published February 2024. Originally approved in 1999. Last previous edition approved in 2016 as D6441 – 05 (2016). DOI: 10.1520/D6441-05R24.

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.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Canadian General Standards Board, (CGSB), 222 Queen St., Ottawa, Ont., Canada K1A 1G6.