



Standard Test Methods for Measuring the Hiding Power of Powder Coatings¹

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^{ε1} NOTE—Last line of Table 1 editorially corrected in February 2000.

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 conform to powder coating industry practice by measuring hiding power in relation to film thickness, rather than the more conventional “Spreading Rate” function employed in Test Methods D 344 and D 2805 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 D 16, D 2805, 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 gage 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 and health practices, and to determine in advance the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 16 Terminology for Paint, and Related Coatings, Materials, and Applications²

D 344 Test Method for Relative Hiding Power of Paints by the Visual Evaluation of Brushouts²

D 2805 Test Method for Hiding Power of Paints by Reflectometry²

D 3451 Practices for Testing Polymeric Powders and Powder Coatings³

E 284 Terminology Relating to Appearance²

E 1331 Test Method for Reflectance Factor and Color by Spectrophotometry Using Hemispherical Geometry²

E 1347 Test Method for Color and Color Difference Measurement by Tristimulus (Filter) Colorimetry²

E 1349 Test Method for Reflectance Factor and Color by Spectrophotometry Using Bidirectional Geometry²

2.2 Other Standard:

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

2.3 Paint & Coatings Testing Manual (Gardner-Sward Handbook), 14th Edition, Chapter 42, Hiding Power⁵

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *reflectance*—term of wide applicability, referring herein to the *luminous reflectance factor* as defined in Terminology E 284, and equivalent to the CIE Tristimulus value *Y* measured in accordance with Test Methods E 1331, E 1347 or Test Method E 1349 with specular reflection excluded. It is expressed as a percentage in this standard.

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

3.1.3 *black substrate*—A substrate with a maximum reflectance of 1 %, which is effectively zero for the purpose of measuring hiding power.

3.1.4 *white reflectance* (R_W)—Reflectance of the applied test film over a white substrate of reflectance *W*.

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

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² *Annual Book of ASTM Standards*, Vol 06.01.

³ *Annual Book of ASTM Standards*, Vol 06.02.

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

⁵ *Paint & Coatings Testing Manual*, MNL 17, ASTM, 1995.