



Designation: D4141/D4141M – 22

Standard Practice for Conducting Black Box and Solar Concentrating Exposures of Coatings¹

This standard is issued under the fixed designation D4141/D4141M; 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 This practice covers two accelerated outdoor exposure procedures for evaluating the exterior weather resistance of coatings applied to substrates.

1.2 The two procedures are as follows:

1.2.1 *Procedure A*—Black Box Exposure.

1.2.2 *Procedure C*—Fresnel Reflector Rack Exposure.

NOTE 1—Procedure B described a Heated Black Box procedure that is no longer in common use and has been removed as of the 2014 revision of this standard.

1.3 This standard does not cover all the procedures that are available to the user for accelerating the outdoor exposure of coatings. Other procedures have been used in order to provide a particular effect; however, the two procedures described here are widely used.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

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

¹ This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.27 on Accelerated Testing.

Current edition approved Jan. 1, 2022. Published January 2022. Originally approved in 1982. Last previous edition approved in 2014 as D4141/D4141M – 14. DOI: 10.1520/D4141_D4141M-22.

2. Referenced Documents

2.1 *ASTM Standards*:²

- D523 Test Method for Specular Gloss
- D660 Test Method for Evaluating Degree of Checking of Exterior Paints
- D661 Test Method for Evaluating Degree of Cracking of Exterior Paints
- D662 Test Method for Evaluating Degree of Erosion of Exterior Paints
- D714 Test Method for Evaluating Degree of Blistering of Paints
- D772 Test Method for Evaluating Degree of Flaking (Scaling) of Exterior Paints
- D823 Practices for Producing Films of Uniform Thickness of Paint, Coatings and Related Products on Test Panels
- D2244 Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
- D4214 Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
- D7091 Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals
- E772 Terminology of Solar Energy Conversion
- G7 Practice for Natural Weathering of Materials
- G90 Practice for Performing Accelerated Outdoor Weathering of Materials Using Concentrated Natural Sunlight
- G113 Terminology Relating to Natural and Artificial Weathering Tests of Nonmetallic Materials
- G141 Guide for Addressing Variability in Exposure Testing of Nonmetallic Materials
- G147 Practice for Conditioning and Handling of Nonmetallic Materials for Natural and Artificial Weathering Tests
- G169 Guide for Application of Basic Statistical Methods to Weathering Tests

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.

*A Summary of Changes section appears at the end of this standard