



Standard Practice for Evaluating the Relative Lightfastness and Weatherability of Printed Matter¹

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1. Scope

1.1 This standard describes procedures for the determination of the relative lightfastness and weatherability of printed matter under the following conditions, which involve exposure to natural daylight or accelerated procedures in the laboratory:

1.1.1 *Method 1*—Daylight behind window glass,

1.1.2 *Method 2*—Outdoor weathering,

1.1.3 *Method 3*—Xenon-arc apparatus with window glass filters to simulate daylight behind window glass,

1.1.4 *Method 4*—Xenon-arc apparatus with water spray and daylight filters to simulate outdoor weathering,

1.1.5 *Method 7*—Fluorescent lamp apparatus to simulate indoor fluorescent lighting in combination with window-filtered daylight.

1.1.6 *Method 8*—Fluorescent lamp apparatus operating with fluorescent cool white lamps to simulate indoor fluorescent lighting.

NOTE 1—Previous versions of this standard included Methods 5 and 6 that are based on enclosed carbon-arc exposures. These methods are described in [Appendix X1](#). The spectral irradiance of the enclosed carbon-arc is a very poor simulation of solar radiation, window glass filtered solar radiation, or the emission of lamps used for interior lighting. In addition, enclosed carbon-arc devices are no longer readily available or commonly used.

1.2 These methods require that a suitable print or other control (reference standard) be run along with the test sample. Color changes due to conditions of exposure may be evaluated by visual examination or instrumental measurement.

1.3 These methods are applicable to prints on any flat substrate including paper, paperboard, metallic foil, metal plate, and plastic film, and are produced by any printing process including letterpress, offset lithography, flexography, gravure, and silk screen.

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

¹ This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.56 on Printing Inks.

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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 determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see Section 8.

2. Referenced Documents

2.1 ASTM Standards:²

D1729 Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials

D2244 Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates

D2616 Test Method for Evaluation of Visual Color Difference With a Gray Scale

D4302 Specification for Artists' Oil, Resin-Oil, and Alkyd Paints

D4674 Practice for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Office Environments

D5067 Specification for Artists' Watercolor Paints

D5098 Specification for Artists' Acrylic Dispersion Paints

E284 Terminology of Appearance

E991 Practice for Color Measurement of Fluorescent Specimens Using the One-Monochromator Method

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

G7 Practice for Atmospheric Environmental Exposure Testing of Nonmetallic Materials

G24 Practice for Conducting Exposures to Daylight Filtered Through Glass

G113 Terminology Relating to Natural and Artificial Weathering Tests of Nonmetallic Materials

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.