



Standard Test Methods for Evaluating the Relative Lightfastness and Weatherability of Printed Matter¹

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1. Scope

1.1 These test methods cover the determination of the relative lightfastness and weatherability of printed matter under the following seven conditions, of which two involve exposure to natural daylight and five involve accelerated procedures in the laboratory:

1.1.1 *Test Method 1*—Daylight behind window glass,

1.1.2 *Test Method 2*—Outdoor weathering,

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

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

1.1.5 *Test Method 5*—Enclosed carbon-arc lamp without water spray,

1.1.6 *Test Method 6*—Enclosed carbon-arc lamps with water spray, and

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

1.2 These test 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 test 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 *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:

D 1729 Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials²

D 2244 Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates²

D 2616 Test Method for Evaluation of Visual Color Differences with a Gray Scale²

D 4302 Specification for Artists' Oils, Resin Oil, and Alkyd Paints³

D 4674 Test Method for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Fluorescent Lighting and Window-Filtered Daylight⁴

D 5067 Specification for Artists' Watercolor Paints³

D 5098 Specification for Artists' Acrylic Emulsion Paints³

E 284 Terminology of Appearance²

E 991 Practice for Color Measurement of Fluorescent Specimens²

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

E 1347 Test Method for Color and Color Difference Measurements of Object-Color Specimens by Tristimulus (Filter) Colorimetry²

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

G 7 Practice for Atmospheric Environmental Exposure Testing of Nonmetallic Materials⁵

G 23 Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials⁵

G 24 Practice for Conducting Exposures to Daylight Filtered Through Glass⁵

G 26 Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials⁵

G 113 Terminology Relating to Natural and Artificial Weathering Tests of Nonmetallic Materials⁵

2.2 ANSI Standard:

PH 2.30 for Graphic Arts and Photography—Color Prints, Transparencies and Photomechanical Reproductions,

¹ These test methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.56 on Printing Inks.

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

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

⁴ *Annual Book of ASTM Standards*, Vol 08.03.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.