



Standard Test Methods for Lightfastness of Colorants Used in Artists' Materials¹

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1. Scope

1.1 Four test methods to accelerate the effects of long term indoor illumination on artists' materials are described below. One of the natural daylight methods and one of the xenon-arc methods are used to categorize the lightfastness of colorants.

1.1.1 *Test Method A*—Exposure in southern Florida to natural daylight filtered through window glass.

1.1.2 *Test Method B*—Exposure in Arizona to natural daylight filtered through window glass.

1.1.3 *Test Method C*—Exposure in a non-humidity controlled xenon-arc device simulating daylight filtered through window glass.

1.1.4 *Test Method D*—Exposure in a humidity controlled xenon-arc device simulating daylight filtered through window glass.

1.2 These test methods are used to approximate the color change that can be expected over time in colorants used in artists' materials exposed indoors to daylight through window glass.

NOTE 1—The color changes that result from accelerated exposure may not duplicate the results of normal indoor exposure in a home, art gallery, or museum. The relative resistance to change, however, can be established so colored materials can be assigned to categories of relative lightfastness.

NOTE 2—Users who wish to test colored materials under fluorescent illumination should consult Practice D4674.

1.3 Lightfastness categories are established to which colorants are assigned based on the color difference between specimens before and after exposure.

1.4 Color difference units are calculated by the CIE 1976 $L^*a^*b^*$ color difference equation.

1.5 These test methods apply to colored artists' materials.

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

1.7 *This standard does not purport to address 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.

2. Referenced Documents

2.1 *ASTM Standards*:²

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

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

D5724 Specification for Gouache Paints

D6901 Specification for Artists' Colored Pencils

E284 Terminology of Appearance

E1347 Test Method for Color and Color-Difference Measurement by Tristimulus Colorimetry

E1348 Test Method for Transmittance and Color by Spectrophotometry Using Hemispherical Geometry

E1349 Test Method for Reflectance Factor and Color by Spectrophotometry Using Bidirectional (45°:0° or 0°:45°) Geometry

G24 Practice for Conducting Exposures to Daylight Filtered Through Glass

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

G141 Guide for Addressing Variability in Exposure Testing of Nonmetallic Materials

G151 Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources

G155 Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

3. Terminology

3.1 *Definitions*—Appearance terms used in these test methods are defined in Terminology E284. Terms relating to natural

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 D01.57 on Artist Paints and Related Materials.

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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.