



Designation: D 4303 – 99

Standard Test Methods for Lightfastness of Pigments Used in Artists' Paints¹

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1. Scope

1.1 Four test methods to accelerate the effects of long term indoor illumination on artists' paints are described as follows:

1.1.1 *Test Method A*—Exposure to natural daylight filtered through glass,

1.1.2 *Test Method B*—Exposure to irradiance from daylight fluorescent lamps,

1.1.3 *Test Method C*—Exposure in xenon-arc irradiance simulating daylight filtered through glass, and

1.1.4 *Test Method D*—Exposure to irradiance from cool white fluorescent lamps and soda-lime glass filtered fluorescent UV sunlamps.

1.2 These test methods are used to approximate the color change that can be expected over time in pigments used in artists' paints in normal indoor exposure.

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

1.3 Lightfastness categories are established to which pigments 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 artists' oil, resin-oil, acrylic emulsion, alkyd, watercolor paints, and gouache paints.

1.6 *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:

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

¹ These test methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.57 on Artists' Paints and Related Materials.

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

D 4302 Specification for Artists' Oil, 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

D 5724 Specification for Gouache Paints³

E 284 Terminology of Appearance²

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

E 1348 Test Method for Transmittance and Color by Spectrophotometry Using Hemispherical Geometry²

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

G 24 Practice for Conducting Natural Light Exposures Under Glass⁵

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

G 151 Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources⁵

G 155 Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials⁵

3. Terminology

3.1 *Definitions*—Appearance terms used in these test methods are defined in Definitions E 284. Terms relating to natural and artificial lightfastness tests are defined in Definitions G 113.

3.1.1 *glass*—as used in these test methods, glass refers to single-strength window glass.

4. Summary of Test Methods

4.1 Color measurements are made on specimens that have been prepared as directed in Specification D 4302, D 5067, D 5098 or D 5724 depending on the vehicle. The measurements are recorded for comparison with readings made after the specimens have been exposed.

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.