



Standard Test Method for Rubber Deterioration—Discoloration from Ultraviolet (UV) or UV/Visible Radiation and Heat Exposure of Light-Colored Surfaces¹

This standard is issued under the fixed designation D1148; 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.

(This test method was prepared jointly by the Society of Automotive Engineers and ASTM International.)

1. Scope

1.1 This test method covers techniques to evaluate the surface discoloration of white or light-colored vulcanized rubber that may occur when subjected to UV or UV/visible exposure from specified sources under controlled conditions of relative humidity, or moisture, and temperature.

1.2 This test method also describes how to qualitatively evaluate the degree of discoloration produced under such conditions.

1.3 The term “discoloration” applies to a color change of the rubber sample, as distinguished from staining (see [Note 1](#)), that refers to a color change of a metal finish in contact with or adjacent to the rubber specimen.

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

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.*

NOTE 1—Tests for staining are covered by Test Methods [D925](#).

2. Referenced Documents

2.1 ASTM Standards:²

[D925](#) Test Methods for Rubber Property—Staining of Surfaces (Contact, Migration, and Diffusion)

[D2244](#) Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates

¹ This test method is under the jurisdiction of ASTM Committee [D11](#) on Rubber and is the direct responsibility of Subcommittee [D11.15](#) on Degradation Tests.

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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.

[D3182](#) Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets

[D3183](#) Practice for Rubber—Preparation of Pieces for Test Purposes from Products

[G151](#) Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources

[G154](#) Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

[G155](#) Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

3. Summary of Test Method

3.1 Specimens to be tested for discoloration are exposed to UV or UV/visible radiation. The specimens shall include one or more control specimens of known discoloration characteristics.

3.2 After exposing the specimens to actinic radiation for specified periods of time, under controlled conditions of relative humidity, or moisture, and temperature, the degree of discoloration is rated against discoloration of the control specimens, which have been exposed simultaneously with the test specimens.

4. Significance and Use

4.1 The surface of white or light-colored vulcanized rubber articles, or vulcanized rubber covered with an organic finish, may discolor when exposed to conditions of humidity, or moisture, heat, and sunlight. This change in color of light-colored rubber surfaces is objectionable to the consumer.

4.2 Results obtained should be treated only as indicating the effect of irradiance from the specified source (either UVA-340 lamps or a xenon arc with a Daylight Filter) and not as equivalent to the result of any natural exposure, unless the degree of quantitative correlation has been empirically established for the material in question.

4.3 This test method may be used for producer-consumer acceptance, referee purposes, and research and development work.