



Designation: D529 – 04

Standard Practice for Enclosed Carbon-Arc Exposures of Bituminous Materials¹

This standard is issued under the fixed designation D529; 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 standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This practice describes test conditions and procedures for enclosed carbon-arc exposures conducted according to Practices **G151** and **G153** for bituminous roofing and waterproofing materials that have a minimum softening point of approximately 95°C (200°F) as determined by Test Method **D36**. (See also Terminology **G113**.)

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

1.3 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D36 Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)

D1669 Practice for Preparation of Test Panels for Accelerated and Outdoor Weathering of Bituminous Coatings

D1670 Test Method for Failure End Point in Accelerated and Outdoor Weathering of Bituminous Materials

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

G141 Guide for Addressing Variability in Exposure Testing of Nonmetallic Materials

G147 Practice for Conditioning and Handling of Nonmetallic Materials for Natural and Artificial Weathering Tests

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

G153 Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

3. Summary of Practice

3.1 Thin films of bitumen are uniformly applied to aluminum panels. Shingles and similar products are cut to size and exposed to specified cycles of temperature, light, and water. A choice of two test cycles is given along with options for determining the period of exposure and evaluating results.

4. Significance and Use

4.1 It is not possible to establish a precise correlation between accelerated and natural weathering because of geographical climatic variations, local weather variation from normal, and local pollutants. This weathering apparatus and procedure are used for comparing the weathering characteristics of bituminous materials against a reference material for which the outdoor weathering characteristics are known. Guide **G141** provides guidance regarding this issue.

5. Apparatus

5.1 The enclosed carbon-arc apparatus used shall conform to the requirements defined in Practices **G151** and **G153**.

5.2 Unless otherwise specified, the spectral power distribution of the enclosed carbon-arc shall conform to the requirements in Practice **G153** for enclosed carbon-arc with borosilicate glass globes.

6. Test Specimens

6.1 Unless otherwise agreed upon, test specimens shall be approximately 70 by 150 mm (2¾ by 5⅞ in.). Bituminous materials shall be applied as uniform coatings on aluminum panels in accordance with Practice **D1669**. Fabricated materials such as bituminous roofing, shingles, and similar products shall be cut to size and their weather surfaces exposed. If these are too flexible to sustain their own weight in a vertical position, they may be mounted on aluminum panels.

6.1.1 At least two test specimens of each material shall be exposed.

6.1.2 Other test specimen sizes may be used to provide sufficient material for post-exposure testing when desired.

¹ This practice is under the jurisdiction of ASTM Committee **D08** on Roofing and Waterproofing and is the direct responsibility of Subcommittee **D08.02** on Prepared Roofings, Shingles, and Siding 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.