Designation: D 4798 – 00

Standard Test Method for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method)[1]

This standard is issued under the fixed designation D 4798; 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.

1. Scope

1.1 This test method covers test conditions and procedures for xenon-arc exposures according to Practices G 151 and G 155 for bituminous roofing and waterproofing materials that have a minimum softening point of approximately 95°C (200°F) as determined by Test Method D 36. (Also see Terminology G 113.)

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:*

D 36 Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)[2]

D 1669 Practice for Preparation of Test Panels for Accelerated and Outdoor Weathering of Bituminous Coatings[2]

D 1670 Test Method for Failure End Point in Accelerated and Outdoor Weathering of Bituminous Materials[2]

G 113 Terminology Relating to Natural and Artificial Weathering Tests of Nonmetallic Materials[3]

G 141 Guide for Addressing Variability in Exposure Testing on Nonmetallic Materials[3]

G 147 Practice for Conditioning and Handling of Nonmetallic Materials for Natural and Artificial Weathering Tests[3]

G 151 Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources[3]

G 155 Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials[3]

3. Summary of Test Method

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 G 141 provides guidance regarding this issue.

5. Apparatus

5.1 The xenon-arc apparatus used shall conform to the requirements defined in Practices G 151 and G 155.

5.2 *Filters*—Daylight filter as described in Practice G 155.

5.3 *Radiometer* —The use of a radiometer to monitor and control the amount of radiant energy received at the specimen is required. The use of the radiometer shall comply with the requirements in Practice G 151.

6. Test Specimens

6.1 Unless otherwise agreed upon, test specimens shall be approximately 70 by 150 mm (2¾by 5⅞ in.). Bituminous materials shall be applied as uniform coatings on aluminum panels in accordance with Practice D 1669. 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 Unless otherwise specified, expose at least three replicate specimens of each test and control material.

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

6.1.3 Follow the procedures described in Practice G 147 for identification, conditioning, and handling of specimens of test, control, and reference materials prior to, during, and after exposure.

6.1.4 Do not mask the face of a specimen for the purpose of showing on one panel the effects of various exposure times. Misleading results may be obtained by this method, since the

[1] This test method is under the jurisdiction of ASTM Committee D-8 on Roofing, Waterproofing, and Bituminous Materials and is the direct responsibility of Subcommittee D08.02 on Prepared Roofings, Shingles, and Siding Materials.

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[2] *Annual Book of ASTM Standards*, Vol 04.04.

[3] *Annual Book of ASTM Standards*, Vol 14.04.