



Designation: D4798/D4798M – 11

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

This standard is issued under the fixed designation D4798/D4798M; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This practice covers test conditions and procedures for xenon-arc exposures according to Practices [G151](#) and [G155](#) for bituminous roofing and waterproofing materials. (See Terminology [G113](#).)

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

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

[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

[G155](#) Practice for Operating Xenon Arc Light Apparatus for

[Exposure of Non-Metallic Materials](#)
[G169](#) Guide for Application of Basic Statistical Methods to Weathering Tests

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 Tests conducted according to this practice are used to compare the weathering characteristics of bituminous materials versus a control material of known outdoor durability. It is not possible to establish a single relationship that is applicable to all materials between time in accelerated tests conducted according to this practice and time in natural weathering because (1) there are geographical climatic variations, local weather variations, and variations in local pollutants, and (2) the relation between accelerated and natural weathering is material dependent with differences in acceleration factors between materials as well as for different formulations of the same material. Guide [G141](#) provides guidance regarding variability in outdoor and accelerated weathering tests and about the use of control materials.

NOTE 1—It is recommended that outdoor weathering be used to validate the laboratory accelerated test in terms of performance ranking.

NOTE 2—This practice can be used for other than bituminous materials, but the significance and use have not been evaluated.

5. Apparatus

5.1 The xenon-arc apparatus used shall conform to the requirements defined in Practices [G151](#) and [G155](#).

5.2 *Filters*—Daylight filter as described in Practice [G155](#).

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 [G151](#).

6. Test Specimens

6.1 Unless otherwise agreed upon, test specimens shall be approximately 70 by 150 mm [$2\frac{3}{4}$ by $5\frac{7}{8}$ in.]. Bituminous

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 Steep Roofing Products and Assemblies.

Current edition approved Jan. 1, 2011. Published January 2011. Originally approved in 1988. Last previous edition approved in 2010 as D4798/D4798M – 10. DOI: 10.1520/D4798_D4798M-11.

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.