



Designation: ~~D2898-07~~ Designation: D 2898 – 08^{ε1}

Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing¹

This standard is issued under the fixed designation D 2898; 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.

^{ε1} NOTE—Mathematical conversion errors were editorially corrected throughout in March 2009.

1. Scope

1.1 This practice covers the durability of a fire-retardant treatment of wood under exposure to accelerated weathering. ~~Two~~Four conditioning methods are ~~described, both~~described. Methods are suitable for application to a test specimen prior to subjecting that specimen to an appropriate fire test.

1.2 This practice is applicable to wood products that have been treated with fire-retardant chemicals by pressure impregnation.

1.3 The test specimens are to be in the form of, or suitable for fabrication into, test specimens, such as those described in Test ~~Test~~-Methods E 84, E 108, and E 1354 and other standard test methods for evaluating the fire performance of fire-retardant-treated wood products.

1.4 The text of these ~~test~~-methods references notes and footnotes that provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of these test methods.

1.5 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.6 *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

D 9 Terminology Relating to Wood and Wood-Based Products

E 84 Test Method for Surface Burning Characteristics of Building Materials

E 108 Test Methods for Fire Tests of Roof Coverings

E 176 Terminology of Fire Standards

E 1354 Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

2.2 ICC Evaluation Service Acceptance Criteria:³

AC 107 Classified Wood Roof Systems

2.3 UL Standards:⁴

UL 790 Tests for Fire Resistance of Roof Covering Material

3. Terminology

3.1 *Definitions*— Definition used in this practice are in accordance with Terminologies D 9 and ~~Terminology~~-E 176, unless otherwise indicated.

¹ These test methods are under the jurisdiction of ASTM Committee D07 on Wood and are the direct responsibility of Subcommittee D07.07 on Fire Performance of Wood. Current edition approved April 15, 2007. Published May 2007. Originally approved in 1970. Last previous edition approved in 2004 as D2898-94(2004). Current edition approved Nov. 1, 2008. Published December 2008. Originally approved in 1970. Last previous edition approved in 2007 as D 2898 – 07.

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.

³ General Electric Type H275 RUV (275 W) or Osram Ultra-Vitalox (300 W), or equivalent, is suitable.

³ Available from ICC Evaluation Service, Inc., 5360 Workman Mill Road, Whittier, CA 90601, <http://icc-es.org>.

⁴ "Correlation of ASTM Exposure Tests for Evaluating Durability of Fire-Retardant Treatment of Wood," by C.A. Holmes, Forest Products Laboratory, Research Paper FPL 194, U.S.D.A. Forest Service, 1973.

⁴ Available from Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062, <http://www.ul.com>.

4. Significance and Use

- ~~4.1 These test methods provide a choice between two~~ 4.1 This practice describes different methods of exposing fire-retardant-treated wood products or assemblies to controlled accelerated weathering or conditioning.
- ~~4.2 The conditioning simulates effects of leaching, drying, temperature, and, in one method, two methods, ultraviolet (UV) light.~~
- ~~4.3 Method A is the method normally specified for regulatory purposes when testing fire-retardant-treated wood that is intended for exterior applications.~~

5. Apparatus

- ~~5.1 The test apparatus shall be capable of subjecting the specimen uniformly to the test conditions described in Section 7.~~
- ~~5.2 No special means of protecting the specimen back and edges are required, but water shall not impinge directly on those surfaces which are not exposed either to the weather in the assembled form, or to fire in the subsequent test. Water spray nozzles shall be provided and arranged so as to distribute water evenly over the exposed specimen surface.~~
- ~~5.3 Heating shall be thermostatically controlled. Forced air movement shall be uniform across the specimen surface, with provisions made for adequate air changes to assure thorough drying.~~
- ~~5.4 In Method B, ultraviolet light shall be distributed as evenly as possible over the specimen surface, using sunlamps directed normal to, and mounted 26 in. (660 mm) above the specimen measured from the bottom of the lamp. One lamp shall be used for each 8 ft~~
- ~~5.3 Accompany drying cycles with heating that is thermostatically controlled. The controlling temperature shall be the air temperature measured 1 in. (25 mm) above the specimen surface. When sunlamps are part of the method, the temperature-measuring device must be shielded from the UV radiation of the sunlamps. Accompany drying with uniform forced air movement across the surface of the decks at a rate of at least 25 ft/min (0.127 m/s). Forced air movement shall be uniform across the specimen surface, with provisions made for adequate air changes to assure thorough drying.~~
- ~~5.4 In Methods B and C, UV light shall be distributed as evenly as possible over the specimen surface. Use sunlamps⁵ providing UV characteristics of 5.0 W/m² (0.74 m²/nm irradiance at a wavelength of 315 to 400 nm at 1 m directed normal to and mounted 26 ± 6 in. (660 ± 152 mm) above the specimen measured from the bottom of the lamp. One lamp shall be used for each 8 ft² (0.74 m²) of specimen, or fraction thereof.~~

5.5 Water Spray Calibrations:

- ~~5.5.1 Measure the horizontal projected area over which each nozzle discharges water to the nearest square foot (0.09 m²). Measure the discharge of water for each nozzle for 1 min.~~
- ~~5.5.2 Monitor the total water use during the test. A commercial water meter is suitable for this purpose.~~
- ~~5.5.2.1 For Method A, the water usage shall be 42 ± 1 gal/ft² (1711 ± 41 L/m²) for a four-day cycle or 73 ± 1.7 gal/ft² (2975 ± 69 L/m²) for a seven-day cycle.~~
- ~~5.5.3 Each day during the water cycle, visually check the water flow from each nozzle for obvious water obstruction in the nozzle and uneven spray patterns. Make adjustments when necessary.~~
- ~~5.5.4 Review the total water flow at the end of each day and at the end of each water cycle. Correct the cause of any off-limit conditions.~~
- ~~5.5.5 The characteristics or quality of the water shall be noted (see Note 1).~~

~~NOTE 1—Note water quality, especially pH and hardness, as it can impact the accelerated weathering of the treated specimens.~~

6. Test Specimen

- ~~6.1 The test specimen shall include all those essential parts of the corresponding fire test specimen that may be~~ subjected to weather exposure in normal use. Shingles or shakes shall be applied to their intended sheathing.
- ~~NOTE 1—Specimens may be mounted~~ 2—It is acceptable to mount specimens in sections that can be reassembled subsequently without trimming into the appropriate fire test specimen.
- ~~6.2 The specimen surface shall have a slope of 4 in 12 in Methods A, C, and D of this standard. For Method B, the surface shall have a slope ranging from 4 in 12 minimum to 8 in 12 maximum.~~

7. Exposure Cycle

- ~~7.1 Method A:~~
- ~~7.1.1 The total duration of this method is twelve weeks (84 days).~~
- ~~7.1.2 Subject the specimens to an exposure cycle consisting of twelve one-week cycles. Each cycle is to consist of 96 h (4 days) of water exposure and 72 h (3 days) of drying.~~
- ~~7.1.2.3 Apply water in a moderately fine spray uniformly over the exposed specimen surfaces by spray nozzles that deliver an average of 0.7 in. (17.8 mm) of water per hour (0.005 mm/s) or 0.0073 gal/min-ft² (0.30 L/min-m²) of specimen surface) at a temperature between 35 and 60°F (2 and 16°C). Do not recirculate the water (see Note 2).~~

⁵ General Electric Type H275 RUV (275 W) or Osram Ultra-Vitalox (300 W), or equivalent, is suitable. General Electric no longer manufactures the Type H275 bulb.