



Standard Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials¹

This standard is issued under the fixed designation E2632/E2632M; 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—The units statement and captions for figures were updated editorially in February 2013.

1. Scope

1.1 This standard prescribes a method to assess the fire-test response characteristics of deck materials when used as the walking surface of a deck. The prescribed fire exposure is intended, under test conditions, to determine the heat release rate and the thermal decomposition modes of decking materials when exposed to a burner flame simulating combustibles burning beneath a deck.²

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 are not necessarily exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems has the potential to result in non-conformance with the standard.

1.3 This standard is used to measure and describe the response of deck materials to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire hazard or fire risk assessment of the deck materials under actual fire conditions.

1.4 *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.*

1.5 Fire testing is inherently hazardous. Adequate safeguards for personnel and property shall be employed in conducting these tests.

¹ This test method is under the jurisdiction of ASTM Committee E05 on Fire Standards and is the direct responsibility of Subcommittee E05.14 on External Fire Exposures.

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² Appendix X1 provides commentary on the background of this test method as well as its potential use for evaluation of coatings and surface treatments of deck products.

2. Referenced Documents

2.1 ASTM Standards:³

D2898 Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing

E176 Terminology of Fire Standards

E2067 Practice for Full-Scale Oxygen Consumption Calorimetry Fire Tests

2.2 ISO Standards:⁴

ISO 13943 Fire Safety – Vocabulary

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology E176 or ISO 13943. When discrepancies exist, the definition in Terminology E176 shall prevail.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *deck surface area, n*—the test specimen area defined by the overall specimen length and width after assembly.

4. Summary of Test Method

4.1 The test method described here measures the heat release rate of deck materials subjected to a flame source located beneath a test specimen.

4.2 The test method employs a diffusion flame based fire source from a nominal 305 mm [12 in.] square burner located underneath the test specimen.

4.3 An 80 kW fire exposure shall be applied to the underside of the test specimen for a period of 3 min after which the burner is extinguished.

³ 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.

⁴ Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, <http://www.iso.org>.

4.4 Fire test response characteristics monitored and recorded shall include heat release of the test specimen utilizing oxygen depletion methodologies as described in Practice E2067. In addition, physical changes of the test specimen during the test shall be recorded.

5. Significance and Use

5.1 This test method addresses the suitability of deck materials by assessing their response to fire hazards associated with sources of flame located beneath the deck material.

6. Deck Test Specimen

6.1 Test material shall be representative of normal daily production and shall be installed according to the manufacturer's instructions. Test material for developmental products shall be so identified.

6.2 *Pre-test Conditioning*—Prior to testing, all materials (deck boards and joist material) shall be conditioned to a constant weight or for a minimum of 30 days at $21 \pm 2^\circ\text{C}$ [$70 \pm 4^\circ\text{F}$] and $50 \pm 5\%$ relative humidity, whichever occurs first. Constant weight shall be defined as occurring when the change

in test material weight is less than or equal to 0.1 % in a 24-h period. For those materials whose fire test response is potentially affected by moisture resident within that material, the moisture content of the test material shall be measured prior to conducting the test.

6.3 *Test Specimen Size*—The overall test specimen width (i.e., direction of joists, see Fig. 1) shall be $710 \pm 51\text{ mm}$ [$28 \pm 2.0\text{ in.}$] to accommodate variations in individual deck board width and spacing. The length of individual deck boards shall be $610 \pm 6\text{ mm}$ [$24 \pm 0.25\text{ in.}$]. The deck surface area shall be the overall test specimen length and width after assembly of the test specimen. The front deck board shall be flush with the ends of the joists. The rear deck board shall overhang the end of the joists by $25 \pm 6\text{ mm}$ [$1 \pm 0.25\text{ in.}$] and rest on the ledger board attached to the test apparatus. Deck board profiles shall not be changed from their manufactured dimensions.

6.4 *Joists*—When constructing the test specimen, the deck materials shall be attached to two nominal 2 by 6-in. Douglas-fir joists with a $406 \pm 5\text{ mm}$ [$16 \pm 0.2\text{ in.}$] center-to-center spacing, creating an approximate 90 mm [approx. 3.5 in.] overhang on one side of each joist.

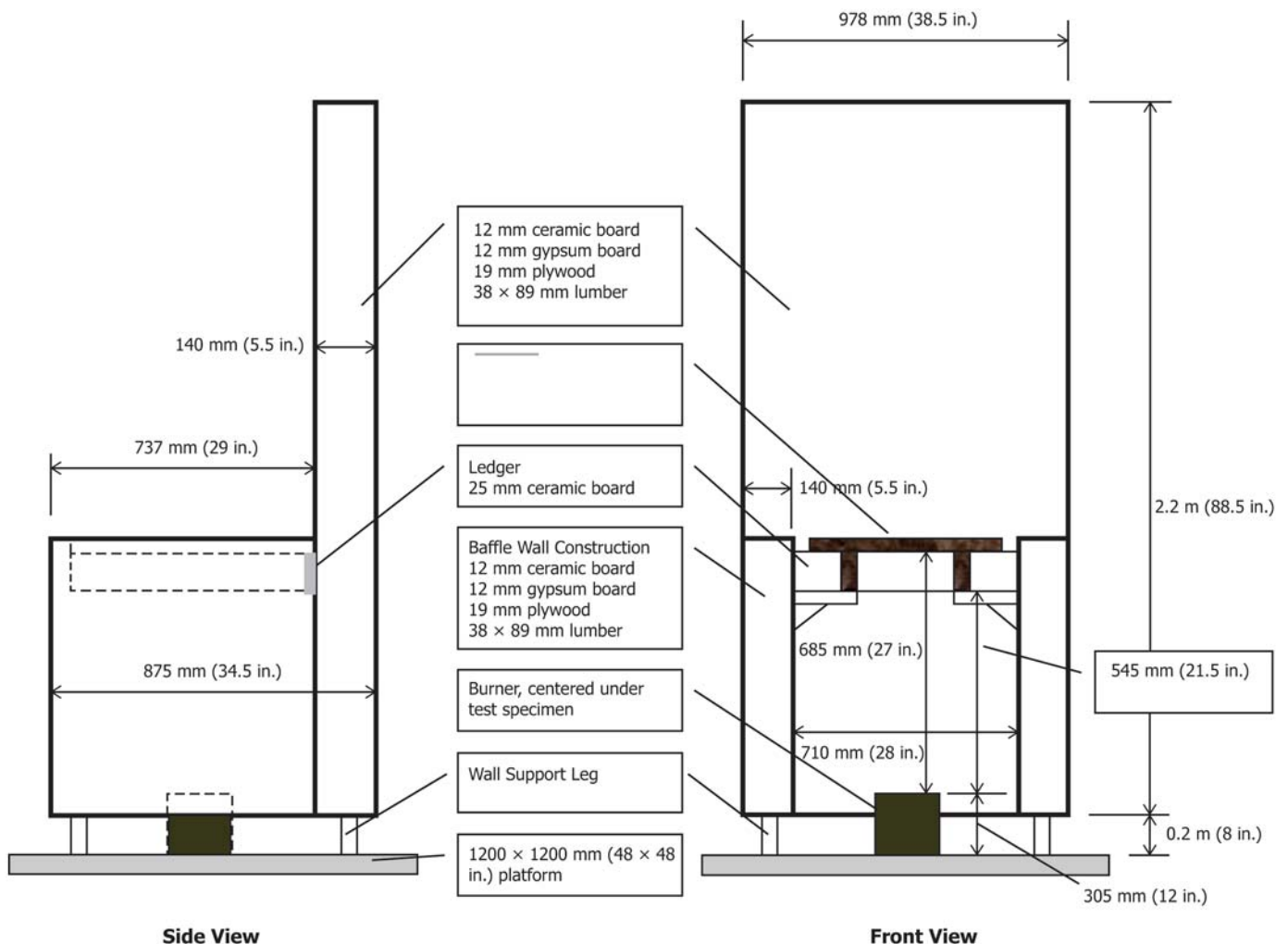


FIG. 1 Schematic Representation of the Under-Deck Test Apparatus