

Designation: E3369 – 24

Standard Specification for Determining the Flood Damage Resistance Rating of Building Materials¹

This standard is issued under the fixed designation E3369; 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 specification covers procedures for determining whether building materials are considered flood-damageresistant for construction intended to comply with the requirements of the National Flood Insurance Program (NFIP) (44 CFR Part 60.3(a)(3)). It was developed from and is intended to supplement specifications in Technical Bulletin 2 (TB 2) $(1)^2$ for purposes of evaluating building materials that comply with requirements of the applicable building code that are not already recognized as acceptable in accordance with TB 2 (1).

1.2 This specification is intended to reduce the burden on the NFIP by improving the ability to construct flood-resistant buildings and structures and thereby decrease the number and magnitude of flood insurance claims. The goal is to identify materials that, when tested as part of an assembly representative of end use configuration, would be permitted for construction below the base flood elevation (BFE) and not require repair after a flood event due to adverse effects of water immersion and subsequent drying on performance.

1.3 This specification is intended to apply to building materials used in new construction, repair of substantially damaged buildings, and substantial improvement of existing buildings in special flood hazard areas (SFHAs) for construction used in non-habitable spaces below the BFE as permitted by the NFIP (44 CFR Part 60.3(a)(3)) and TB 2 (1) including, but not limited to, building materials used in foundations, walls, floors, ceilings, stairways, exterior cladding, and other similarly incorporated architectural and structural items. Evaluation of products for use in habitable spaces is outside of the scope of this specification.

1.4 This specification includes requirements for the purpose of evaluating effects of flooding on specimen physical properties, drying, and the ability to be cleaned. 1.5 The performance of a material specimen under the specified water immersion and drying conditions shall not be construed as fully representative of performance of the material for an actual flood event because actual flood conditions vary in factors such as makeup of water, and depth and duration of immersion, and drying conditions vary by factors such as ambient temperature and humidity.

1.6 Performance requirements vary based on the type of building material and the functions the building material is required to perform. The body of the specification gives general requirements applicable to a broad range of building materials with annexes provided for material-specific requirements.

1.7 Performance requirements for evaluation of other hazards associated with flood damage are outside the scope of this specification. These hazards include, but are not limited to, debris impact, flood velocity, wave action, water pressure differential, scour, erosion, varied biological contaminants in flood water including fungal matter and sewage, and chemical contaminants in floodwater, and other factors that would be adverse to continued use of the structure for its intended purpose including long-term occupant health impacts.

1.8 A commentary to this specification is provided in Appendix X1.

1.9 Units—The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to International System of Units (SI) units that are provided for information only and are not considered standard.

1.10 The text of this standard 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 the standard.

1.11 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.12 This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the

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 $^{^{2}\,\}mathrm{The}$ boldface numbers in parentheses refer to a list of references at the end of this standard.

Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 ASTM Standards:³

- D2898 Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing
- D3274 Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Fungal or Algal Growth, or Soil and Dirt Accumulation
- D7338 Guide for Assessment Of Fungal Growth in Buildings

E631 Terminology of Building Constructions

- E3075 Test Method for Water Immersion and Drying for Evaluation of Flood Damage Resistance
- 2.2 ASCE Standard:⁴

ASCE 24 Flood Resistant Design and Construction

- 2.3 ANSI Standards:⁵
- ANSI/IICRC S500 Standard for Professional Water Damage Restoration
- ANSI/IICRC S520 Standard for Professional Mold Remediation

2.4 Federal Standard:⁶

- 44 CFR Part 60.3(a)(3) Flood plain management criteria for flood-prone areas
- 2.5 U.S. Product Standards:
- US DOC PS 1 Structural Plywood⁷

US DOC PS 20 American Softwood Lumber Standard⁸

2.6 Other Standards:⁹

- AWPA U1 Use Category System: User Specification for Treated Wood
- 3. Terminology atalog/standards/astm/777f0648-7511-434

3.1 Definitions are in accordance with Terminology E631, unless otherwise specified.

3.2 Definitions of Terms Specific to this Standard (Consistent with NFIP):

3.2.1 *base flood*, *n*—the flood that has a one percent chance of being equaled or exceeded in any given year (commonly called the "100-year" flood).

 $^7\,{\rm Available}$ from National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899.

⁸ Available from US Department of Commerce, 1401 Constitution Ave NW, Washington, DC 20230.

⁹ Available from American Wood Protection Association, Inc., 100 Chase Park S #116, Birmingham, AL 35244. 3.2.2 base flood elevation (BFE), n—the height of the base flood in relation to a specified datum, usually the North American Vertical Datum of 1988, or the National Geodetic Vertical Datum of 1929.

3.2.3 *flood-damage-resistant, adj*—capable of withstanding direct and prolonged contact with water without requiring repair.

3.2.4 *prolonged contact, n*—a period of time not less than 72 h.

4. Significance and Use

4.1 The procedures described in this specification are intended to be used to classify building materials as "acceptable" or "unacceptable" for flood damage resistance in accordance with the requirements of the National Flood Insurance Program (NFIP) (44 CFR Part 60.3(a)(3)) and TB 2 (1).

4.2 This specification is intended to evaluate a material specimen's response to water immersion and ability to be cleaned following the specified exposure and drying conditions in Section 6 and the material specimen's continued suitability for its required function in accordance with applicable building code requirements without repair.

5. Test Specimens

5.1 Test specimens shall be representative of installed building materials for which a flood damage resistance rating is sought.

5.2 Components of walls, floors, and ceilings shall be tested as installed in a representative assembly, which shall include joints, fasteners, adhesives, and other materials as appropriate to the intended function of the assembly. Wall assemblies shall be tested vertically, and floor and ceiling assemblies shall be tested horizontally.

5.3 Structural members, such as beams, columns, and piles, that may be placed below the floor shall be permitted to be tested in isolation.

5.4 Specimen Size:

5.4.1 Wall assembly test specimens shall be of suitable size to enable evaluation of the assemblage of full-size building material components that make up the wall assembly.

5.4.2 Floor assembly test specimens and ceiling assembly test specimens shall be of suitable size to enable evaluation of the assemblage of full-size building material components that make up the floor assembly or ceiling assembly.

5.4.3 For building materials tested in isolation, specimen dimensions shall be representative of the end-use product dimensions.

5.5 *Number of Specimens*—Three identical specimens shall be tested unless otherwise specified in the applicable material-specific annex. For Method A, a minimum of three control specimens constructed of recognized flood-damage-resistant materials shall also be tested.

6. Water Immersion, Drying and Cleaning Requirements

6.1 Specimens shall be tested in accordance with Test Method E3075.

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 American Society of Civil Engineers (ASCE), 1801 Alexander Bell Dr., Reston, VA 20191, http://www.asce.org.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

⁶ Available from U.S. Government Accountability Office (GAO), 441 G St., NW, Washington, DC 20548, http://www.gao.gov.