



Designation: E1993/E1993M – 98 (Reapproved 2020)

# Standard Specification for Bituminous Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs<sup>1</sup>

This standard is issued under the fixed designation E1993/E1993M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers bituminous water vapor retarders for use in contact or granular fill under concrete slabs.

1.2 The specified tests are conducted on new materials and materials that have been conditioned or exposed to simulate potential service conditions.

1.3 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, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

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

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the 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:<sup>2</sup>

[C168 Terminology Relating to Thermal Insulation](#)

[D828 Test Method for Tensile Properties of Paper and Paperboard Using Constant-Rate-of-Elongation Apparatus](#)

[D1790 Test Method for Brittleness Temperature of Plastic Sheeting by Impact](#)

[D5147/D5147M Test Methods for Sampling and Testing Modified Bituminous Sheet Material](#)

[E96/E96M Test Methods for Water Vapor Transmission of Materials](#)

[E154/E154M Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover](#)

[E631 Terminology of Building Constructions](#)

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, see Terminologies [C168](#) and [E631](#).

### 3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *perm, n*—the time rate of water vapor migration through a material or a construction of one grain per hour, square foot, inch of mercury pressure difference.

3.2.1.1 *Discussion*—If a specification states that a one perm limit is required, the same flow rate will be obtained from the following relationships:<sup>3</sup>

|        |  |                                      |
|--------|--|--------------------------------------|
| 1 perm | = 1 grain/(h · ft <sup>2</sup> · in Hg)                | inch pound                           |
|        | = 57.2 10 <sup>-12</sup> kg/(Pa · s · m <sup>2</sup> ) | SI Fundamental Units                 |
|        | = 57.2 ng/(Pa · s · m <sup>2</sup> )                   | SI Frequently Used                   |
|        | = 0.66 g/24h · m <sup>2</sup> · mm Hg                  | SI has been used but is now obsolete |

3.2.2 *vapor retarder, n*—(formally vapor barrier) a material or construction that impedes the transmission of water vapor under specified conditions.

3.2.3 *water vapor permeability, n*—a property of material which is water vapor permeance through unit thickness. Since materials that provide resistance to vapor flow are never used in unit thickness, the evaluation of both materials and constructions used herein is permeance.

## 4. Sampling

4.1 Each sampling shall consist of sufficient material to provide at least five specimens for the tests listed in Section 7.

## 5. Specifying Information

5.1 Specification for materials shall include the following:

5.1.1 This specification number, and

<sup>3</sup> See 3.2.3 of Test Methods [E154/E154M](#). This conversion is based on a temperature of 0 °C [32 °F] and not on an environmental temperature of 23 °C [73.4 °F].

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and are the direct responsibility of Subcommittee E06.21 on Serviceability.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.