Designation: E 1745 – 97

An American National Standard

Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs[1]

This standard is issued under the fixed designation E 1745; 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 flexible, preformed sheet membrane materials to be used as vapor retarders in contact with soil or granular fill under concrete slabs.

1.1.1 A task group in Subcommittee E06.21 is working on a specification for bituminous vapor retarders.

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

2. Referenced Documents

2.1 *ASTM Standards:*

C 168 Terminology Relating to Thermal Insulating Materials[2]

D 828 Test Method for Tensile Properties of Paper and Paperboard Using Constant-Rate-of-Elongation Apparatus[3]

D 882 Test Methods for Tensile Properties of Thin Plastic Sheeting[4]

D 1709 Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method[4]

E 96 Test Methods for Water Vapor Transmission of Materials[2]

E 154 Test Methods for Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover[5]

E 631 Terminology of Building Constructions[5]

F 1249 Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor[3]

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, see Terminologies C 168 and E 631C 168E 631.

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:

1 perm = 1 grain/h · ft^2 in. · Hg (inch·pound)
= 57.2 10^{-12} kg/(Pa· s · m^2) (SI fundamental units)
= 57.2 ng/(Pa · s · m^2) (SI frequently used)
= 0.66 g/24 h · m^2· mm Hg (SI has been used but is now obsolete)

3.2.2 *vapor retarder*, *n*—(formerly 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 preferred evaluation of both materials and constructions is the permeance.

3.2.4 *water-vapor permeance*, *n*—the time rate of water vapor flow through unit area of the known thickness of a flat material or a construction normal to two specific parallel surfaces induced by unit vapor pressure difference between the two surfaces under specific temperature and humidity conditions. See *perm*.

4. Classification

4.1 Materials shall be specified to conform to one of these three classes: A, B, or C, or specific requirements shall be specified in one or more of the properties listed in Table 1.

5. Specifying Information

5.1 Specifications for materials shall include the following:

5.1.1 This specification number.

5.1.2 Class A, B, or C, or alternatively, specific performance requirements for each of the properties listed in Table 1.

5.1.3 Performance requirements, if any, for special conditions (see 7.3).

6. Lap Sealing

6.1 The producer shall provide instructions for lap sealing, including minimum width of lap, method of sealing, and either supply or specify suitable products for lap sealing.

[1] This specification is under the jurisdiction of ASTM Committee E-6 on Performance of Buildings and is the direct responsibility of Subcommittee E06.21 on Serviceability.

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[2] *Annual Book of ASTM Standards*, Vol 04.06.

[3] *Annual Book of ASTM Standards*, Vol 15.09.

[4] *Annual Book of ASTM Standards*, Vol 08.01.

[5] *Annual Book of ASTM Standards*, Vol 04.11.