



Standard Test Method for Elevated Temperature and Humidity Resistance of Vapor Retarders for Insulation¹

This standard is issued under the fixed designation C 1258; 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 test method covers the determination of the aging resistance of flexible low permeance vapor retarders for thermal insulation as classified in Specification C 1136. Water vapor permeance measurement and visual inspection after exposure at elevated temperature and humidity are used to assess vapor retarder response.

1.2 Typical vapor retarders applicable to this test method that are intended for indoor use include foil-scrim-kraft laminates, metallized polyester-scrim-kraft laminates, treated fabrics, treated papers, films, foils, or combinations of these materials that may comprise a vapor retarder material. This test method is not intended for assessment of the liquid-applied coatings, sealants, or mastics commonly used with insulation products.

1.3 The values stated in inch-pound units are to be regarded as standard. The SI units given in parentheses are for information purposes only.

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.*

2. Referenced Documents

2.1 ASTM Standards:

- C 1136 Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation²
- E 96 Test Methods for Water Vapor Transmission of Materials²

3. Summary of Test Method

3.1 The vapor retarders are subjected to accelerated aging via elevated temperature and humidity at 120°F (49°C) and 95 % relative humidity for a period of 28 days, then visually inspected for corrosion (if applicable), delamination, or other degradation. Water vapor permeance in accordance with Test Methods E 96 is measured after humid aging.

¹ This test method is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.33 on Insulation Finishes and Moisture.

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

4. Significance and Use

4.1 On sub-ambient temperature systems, humid ambient conditions cause a vapor driving force toward the insulation which, if not retarded, is detrimental to the insulation's thermal resistance. Therefore a vapor retarder should resist degradation. Degradation in this test method is induced by elevated temperature and humidity conditions.

5. Apparatus

5.1 *Environmental Chamber*, capable of maintaining $120 \pm 2^\circ\text{F}$ ($49 \pm 1^\circ\text{C}$) and $95 \pm 2\%$ relative humidity, using distilled or deionized water as the humidity source. The chamber shall be of the air-circulating variety.

5.2 *Lighted Box in a Darkened Room*—A lighted box is an enclosure having five opaque sides with one transparent glass or plastic viewing side. The box is illuminated using an incandescent lightbulb. The viewing area shall be slightly smaller than the vapor retarder specimen so that holes or degradation caused by aging are readily visible.

5.3 *Cotton Gloves*.

5.4 *Cardboard Overhead Transparency Frames or Equivalent*.

5.5 *Stainless Steel Staples*.

5.6 *Glass or Stainless Steel Rods*.

6. Test Specimens

6.1 From each sample cut four specimens that are large enough to acquire water vapor permeance test specimens after exposure. The specimens shall be cut in a manner which best characterizes the roll width. Material exhibiting extraneous damage from mishandling in shipment or during sample preparation shall be avoided. A fifth specimen shall be cut and retained as a control. An $11\frac{3}{4}$ in. (298 mm) by $10\frac{3}{4}$ in. (273 mm) specimen size is recommended since this is the size of a typical overhead transparency frame, which is useful to support specimens in the humidity chamber. In any case, the specimen size shall be at least 6 in. by 6 in. (152 mm by 152 mm).

7. Aging Procedure

7.1 Use clean cotton gloves during handling to avoid surface contamination that may be confused with corrosion on foil or metallized laminates.

7.2 Once cut to the desired size, individually sandwich and