



Designation: D6490 – 99 (Reapproved 2006)

Standard Test Method for Water Vapor Transmission of NonFilm Forming Treatments Used on Cementitious Panels¹

This standard is issued under the fixed designation D6490; 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 rate at which water vapor passes through non film forming treatments, such as silanes, siloxanes and blends of silanes/siloxanes applied to cementitious substrates.

1.2 This test method covers the use of the wet cup technique, which most closely approaches the exterior conditions for use for these materials. Other conditions can be used if agreed upon between purchaser and supplier. Agreement should not be expected between results obtained by different methods or test conditions.

1.3 The values stated in SI units of measurement are designated as the standard. Factors for conversion to inch-pound units are given in 9.2.1.1 and 9.2.2.1.

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:*²

D823 Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels

D1193 Specification for Reagent Water

D1734 Practice for Making Cementitious Panels for Testing Coatings

D3924 Specification for Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials

E104 Practice for Maintaining Constant Relative Humidity by Means of Aqueous Solutions

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.47 on Concrete, Stone and Masonry Treatments.

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² 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.

3. Summary of Test Method

3.1 The treated cementitious substrate is sealed to the open mouth of an assembly containing water with the treated side facing the water, and the assembly placed in a test chamber with a controlled atmosphere maintained at 50 ± 5 % relative humidity at $23 \pm 2^\circ\text{C}$ ($73.5 \pm 3.5^\circ\text{F}$). Periodic weighings of the assembly are made to determine the rate of water vapor movement through the specimen.

4. Significance and Use

4.1 One of the factors affecting the performance provided by a cementitious treatment is how readily water vapor passes through it. Hence, the water vapor transmission characteristics of treatments are important in assessing their performance in practical use.

4.2 The purpose of this test method is to obtain values of water vapor transfer through treatments that range in permeability from high to low. These values are for use in design, manufacture, and marketing.

4.3 Water vapor transmission is not a linear function of film thickness, temperature or relative humidity.

4.4 Values of water vapor transmission rate (WVT) and water vapor permeance (WVP) can be used in the relative rating of treatments only if the treatments are tested under the same closely controlled conditions of temperature and relative humidity.

5. Apparatus

5.1 *Assembly*, consisting of a container, typically with an opening of approximately 75 mm (3 in.) by 150 mm (6 in.). The depth of the dish is such that there is a 20 ± 5 mm (0.8 ± 0.2 in.) distance between the water surface and the surface of the under surface of the test specimen, with a water depth of at least 5 mm (0.2 in.). The assembly should be made of a noncorroding material, impermeable to water or water vapor in order to be found acceptable. The treated cementitious substrate can be sealed with wax or sealant to the assembly. If the assembly is made of aluminum, it must be anodized or given a protective clear coating to prevent corrosion.