



Designation: E2268 – 04

Standard Test Method for Water Penetration of Exterior Windows, Skylights, and Doors by Rapid Pulsed Air Pressure Difference¹

This standard is issued under the fixed designation E2268; 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 resistance of exterior windows, skylights, and doors to water penetration when water is applied to the outdoor face and exposed edges simultaneously with a rapid pulsed air pressure at the outdoor face higher than the pressure at the indoor face.

1.2 This test method is applicable to windows, skylights, or doors alone. Those interested in testing curtain walls to rapid pulsed air pressure differences should use [AAMA 501.1-94](#).

1.3 This test method addresses water penetration through a manufactured assembly. Water that penetrates the assembly, but does not result in a failure as defined herein, may have adverse effects on the performance of contained materials such as sealants and insulating or laminated glass. This test method does not address these issues.

1.4 The proper use of this test method requires a knowledge of the principles of pressure measurement.

1.5 The values stated in SI units are to be regarded as the standard. The inch-pound equivalents of SI units may be approximate.

1.6 *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

[E631 Terminology of Building Constructions](#)

2.2 *AAMA Standard*:³

[AAMA 501.1-94](#) Standard Test Method for Exterior Windows, Curtain Walls and Doors for Water Penetration

¹ This test method is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.51 on Performance of Windows, Doors, Skylights, and Curtain Walls.

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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 Available from American Architectural Manufacturers Association (AAMA), 1827 Walden Office Square, Suite 550 Schaumburg, IL 60173.

Using Dynamic Pressure

3. Terminology

3.1 *Definitions*—For definitions of general terms relating to building construction used in this test method, see Terminology [E631](#).

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *pulsed, v*—subjected to a transition from one level of differential air pressure to another and back within a prescribed time period.

3.2.2 *pulse generator, n*—test apparatus capable of producing rapid changes of air pressure between two prescribed levels within a specified time period (see [Fig. 3](#)).

3.2.3 *specimen, n*—the entire assembled unit submitted for test as described in Section 8.

3.2.4 *test pressure difference, n*—the specified difference in dynamic air pressure across the closed and locked or fixed specimen expressed as Pascals (lbf/ft²).

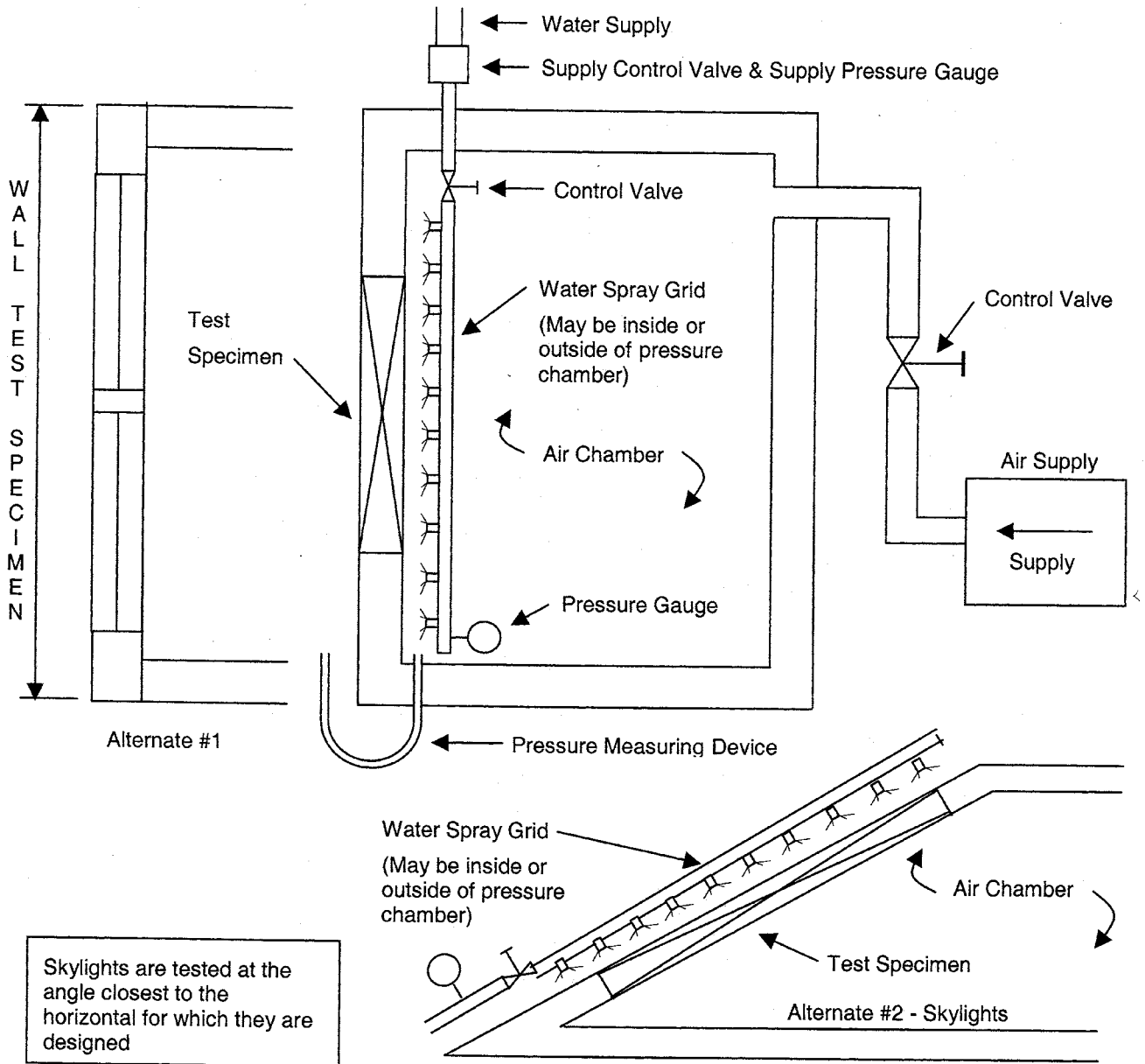
3.2.5 *water penetration, n*—penetration of water beyond a plane parallel to the glazing intersecting the innermost projection of the test specimen, not including interior trim and hardware, under the specified conditions of air pressure difference across the specimen. For products with non-planar glazing surfaces (domes, vaults, pyramids, and so forth) the plane defining water penetration is the plane defined by the innermost edges of the unit frame.

4. Summary of Test Method

4.1 This test method consists of sealing the test specimen into or against one face of a test chamber and supplying air to or exhausting air from the chamber at a rapid cyclic rate across the specimen for the time specified, while spraying water onto the outdoor face of the specimen at the required rate and observing any water penetration.

5. Significance and Use

5.1 This test method is a standard procedure for determining the resistance to water penetration during rapid cyclic pulses of dynamic air pressure differences. The air-pressure differences acting across a building envelope vary greatly. These factors should be fully considered prior to specifying the test pressure difference to be used.



NOTE—For a negative pressure system, the water-spray grid would be located outside the chamber and the air supply would be replaced by an air-exhaust system.

FIG. 1 General Arrangement of the Water Leakage Apparatus Positive Chamber System

5.2 The median test pressure used in this test method is defined as the specified test pressure supplied by the user and related to the maximum positive building design pressure. This test method departs from the format of other ASTM water penetration resistance test methods based on a maximum test pressure related to a maximum positive building design pressure.

5.3 As the specified or median test pressure is increased, the maximum test pressure in this procedure is also increased to 1.5 times the specification median test pressure. This higher maximum test pressure may not be representative of actual

building service conditions. For this reason the maximum recommended median test pressure is 480 Pa (10 psf), which corresponds to a maximum test pressure of 720 Pa (15 psf).

5.4 The pulsed pressure of this test method may act to pump water past dry seals and breather systems of units incorporating these features, thereby making the test method more severe than a static pressure test method. On the other hand, the low pressure portions of the pressure cycles of this test method may allow weep systems and drainage dams to dissipate water from units incorporating these features, thereby making the test method less severe than a static pressure test method.