



STANDARD FOR WATER PENETRATION (ASTM E1105) PERFORMANCE ASSURANCE

ZERO/SIX CONSULTING, LLC

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STANDARD FOR WATER PENETRATION

Water is both our most vital resource and our most destructive force. Hurricanes aside, what begins as a single raindrop can develop into a growing and moving force in a matter of a few hours that result in millions of dollars lost each year through the penetration of water through doors, exterior windows, curtain walls, and skylights. To protect against this destructive force, a standardized test procedure was created as a critical component to the quality assurance and commissioning process of a building enclosure.

The ASTM E1105 Standard for Water Penetration was developed as a field testing procedure to:

- Establish expectations early in the commissioning process and a standard of quality of materials and workmanship throughout.
- Define allowable water leakage and determine the roles and responsibilities toward resolution if observed.

- Test performance against criteria such as test pressures.
- Determine how far those criteria should extend; for example, assemblies, the joints between the assemblies, and the adjacent construction.



Water resistance tests are performed on specimens to check for water penetration under cyclic and static air pressure. The air pressure is intended to simulate actual natural weather characteristics such as normal and extreme rainstorm with wind events.

HOW Z6 APPLIES THE ASTM E1105 STANDARD

The ASTM E1105 test method consists of sealing a chamber to the interior or exterior face of the specimen to be tested, supplying air to a chamber mounted on the exterior or exhausting air from a chamber mounted on the interior, at a rate required to maintain the calibrated test pressure difference across the specimen while spraying a calibrated water delivery onto the outdoor face of the specimen at the specified rate and observing any water penetration—per Section 4, ASTM E1105.

The ASTM E1105 test procedure is specifically written for field testing. Z6 applies the standard using a calibrated spray apparatus (spray rack) adhering to one of two processes:

- The first requires a uniform static pressure on the specimen for a period of 15 minutes.

- The second process cycles the pressure across the specimen as stipulated by the specifier or according to the standard of five minutes on, one minute off, for three cycles.

A successful test will demonstrate the item either meets or does not meet the selected performance criteria for resistance to water penetration. Failure criteria of this test method shall be defined as water penetration beyond a plane parallel to the glazing (the vertical plane) intersecting the innermost projection of the test specimen, not including the interior trim and hardware, under the specified conditions of air pressure difference across the specimen. Note: Water that does not travel beyond the limits of the glazing system is allowable.

TYPES OF TESTS PERFORMED



UNIFORM STATIC AIR PRESSURE

Water penetration testing is conducted at the specified air pressure differential while simultaneously spraying water on to the exterior face of the assembly at the required rate of 5 gph/ft². During testing, the interior face of the test area is inspected for water leakage. Testing continues for 15 minutes.



CYCLIC STATIC AIR PRESSURE

Water penetration testing is conducted at the specified air pressure differential. Three cycles are employed during the test unless otherwise requested. Each cycle consists of 5 minutes with the air pressure applied and 1 minute with the air pressure released. Water is applied continuously at the required rate of 5gph/ft². During testing, the interior face of the test area is inspected for water infiltration.



APPLICATIONS



The ASTM E1105 test can be applied to the following installed exterior systems:



Curtain Walls



Doors



Skylights



Windows



WHY ZERO/CONSULTING?

Z6 is accredited to the highest possible standard of this testing through the ANAB/ILAC ISO/IEC 17025 standards organization. This accreditation reinforces our commitment to adhering to the ASTM E1105 (Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference) standards for all water penetration testing. This allows Z6 to provide the building owner with an ISO/IEC accredited report that determines a building's water infiltration. ISO/IEC 17025 accreditation requires an audited adherence to the highest international standards in the industry, as well as, provides evidence of integrity and impartiality in all testing procedures undertaken.



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