



Standard Test Method for Quantification of Air Intrusion in Low-Sloped Mechanically Attached Membrane Roof Assemblies¹

This standard is issued under the fixed designation D7586/D7586M; 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 provides a laboratory technique for determining the air intrusion in low-sloped mechanically attached membrane roof assemblies under specified negative air pressures differences.

1.2 This test method is intended to measure only air intrusion associated with the opaque roof assembly free from penetrations such as those associated with mechanical devices, roof junctions, and terminations.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

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

D1079 Terminology Relating to Roofing and Waterproofing

E283 Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

E631 Terminology of Building Constructions

E2357 Test Method for Determining Air Leakage of Air Barrier Assemblies

3. Terminology

3.1 For definitions of general terms relating to roofing and building construction used in this test method, refer to Terminologies **D1079** and **E631**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *air intrusion*—the mechanism by which indoor air enters into a roof assembly but does not escape to the exterior environment.

3.2.2 *air leakage*—the movement/flow of air from one environmental condition to the other environmental condition through the building envelope assembly which is driven by either positive or negative pressure differences, or both across the envelope assembly.

3.2.3 *extraneous leakage*, L/s (ft³/min)—the volume of air flowing per unit time into the bottom test chamber due to its leakiness, under a pressure difference.

3.2.4 *flow rate*, L/s—the volume of air flow per unit time.

3.2.5 *specimen air intrusion*, L (ft³)—the volume of air intruding into the membrane assembly specimen under a test pressure difference.

3.2.6 *test pressure difference*, Pa (lbf/ft²) —the specified difference in static air pressures across the membrane assembly specimen.

3.2.7 *standard conditions*—dry air at a pressure of 101 kPa (29 in. Hg), temperature of 21°C (69°F) and air density of 1.2 kg/m³ (0.075 lb/ft³).

4. Summary of Test Method

4.1 The test consists of installing a mechanically attached membrane assembly specimen between two chambers; specifically an airtight bottom chamber into which air flows and a top chamber that exhausts air at a rate required to maintain the specified negative pressure across the membrane assembly specimen. The resultant air intrusion into the membrane

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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.