



Standard Test Method for Determining Air Flow Through the Face and Sides of Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen¹

This standard is issued under the fixed designation E 2319; 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 is a modified version of Test Method E 283, and provides a standard laboratory procedure for determining air leakage separately through the face and sides of exterior windows, curtain walls, and doors under specified differential pressure conditions across the specimen. The test method described is for tests with constant temperature and humidity across the specimen.

NOTE 1—Detailing buildings with continuous air barriers requires that the air barrier plane in a window system be clearly defined. When special circumstances dictate that the air barrier be sealed to the window frame at a location other than that used to seal the specimen to the test chamber in this test method, additional laboratory testing may be required to clarify potential paths of air flow through the sides of the window frame. The adapted testing procedure described herein is intended for this purpose.

1.2 This laboratory procedure is applicable to exterior windows, curtain walls, and doors and is intended to measure only such leakage associated with the assembly and not the installation. The test method can be adapted for the latter purpose.

NOTE 2—Performing tests at non-ambient conditions or with a temperature differential across the specimen may affect the air leakage rate. This is not addressed by this test method.

1.3 This test method is intended for laboratory use. Persons interested in performing field air leakage tests on installed units should reference Test Method E 783. Test Method E 783 will not provide the user with a means of determining air flow through the sides of tested specimens.

1.4 Persons using this procedure should be knowledgeable in the areas of fluid mechanics, instrumentation practices, and shall have a general understanding of fenestration products and components.

1.5 Throughout this test method, SI units are listed first in accordance with E06 metric policy, and shall be considered the primary units. Non-SI units are provided in parenthesis for reference purposes.

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.* For specific hazard statement see Section 7.

2. Referenced Documents

2.1 ASTM Standards:²

E 283 Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

E 631 Terminology of Building Constructions

E 783 Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors

3. Terminology

3.1 *Definitions*—Terms used in this standard are defined in Terminology E 631.

3.2 Descriptions of Terms Specific to This Standard:

3.2.1 *air leakage rate through the face of the specimen* ($q_{A(f)}$ or $q_{l(f)}$), $L/(s \cdot m^2)$ ($ft^3/min \cdot ft^2$), or $L/(s \cdot m)$ ($ft^3/min \cdot ft$)—the air leakage through the face of the specimen per unit of specimen area (A) or per unit length of operable crack perimeter (l_c).

3.2.2 *air leakage rate through the face and sides of the specimen* ($q_{A(fs)}$), $L/(s \cdot m^2)$ ($ft^3/min \cdot ft^2$)—the air leakage through the face and sides of the specimen per unit of specimen area (A).

3.2.3 *air leakage rate through the sides of the specimen* ($q_{A(s)}$ or $q_{l(f)s}$), $L/(s \cdot m^2)$ ($ft^3/min \cdot ft^2$), or $L/(s \cdot m)$ ($ft^3/min \cdot ft$)—the air leakage through the sides of the specimen per unit of specimen area (A) or per unit length of outside perimeter of specimen frame (l_f).

3.2.4 *air leakage through the face of the specimen* ($Q_{s(f)}$), L/s (ft^3/min)—the volume of air flowing per unit of time

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.

