



Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure and Temperature Differences Across the Specimen¹

This standard is issued under the fixed designation E1424; 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 standard laboratory procedure for determining the air leakage rates of exterior windows, curtain walls, and doors under specified differential air temperature and pressure conditions across the specimen.

1.2 Specified temperature and pressure conditions are representative of those that may be encountered at the exterior thermal envelope of buildings, excluding the effects of heat buildup due to solar radiation.

1.3 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; however, the test method can be adapted for the latter purpose.

1.4 This is a laboratory procedure for testing at differential temperature conditions. Persons interested in a laboratory test at ambient conditions should reference Test Method E283. Persons interested in a field test on installed windows and doors should reference Test Method E783.

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

1.6 The values stated in SI units are to be regarded as standard. The inch-pound units given in parenthesis are provided for information only.

1.7 *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 applica-*

bility of regulatory limitations prior to use. For specific hazard statements, see Section 7.

2. Referenced Documents

2.1 ASTM Standards:²

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

E783 Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors

3. Terminology

3.1 *Definitions*—Terms used in this test method are defined in Terminology E631.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *air leakage rate* (q_A or q_L)—the air leakage per unit of specimen area (A) or per unit length of operable crack perimeter (L), expressed as $\text{m}^3/\text{s}\cdot\text{m}^2$ ($\text{ft}^3/\text{min}\cdot\text{ft}^2$) or $\text{m}^3/\text{s}\cdot\text{m}$ ($\text{ft}^3/\text{min}\cdot\text{ft}$).

3.2.2 *extraneous air leakage* (Q_e)—the volume of air flowing per unit of time through the test chamber and test apparatus, exclusive of the air flowing through the test specimen, under a test pressure difference and test temperature difference, converted to standard conditions, expressed in m^3/s (ft^3/min).

3.2.2.1 *Discussion*—Extraneous leakage is the sum of all leakage other than that intended to be measured by the test.

3.2.3 *specimen air leakage* (Q_s)—the volume of air flowing per unit of time through the specimen under a test pressure difference and test temperature difference, converted to standard conditions, expressed in m^3/s (ft^3/min).

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.