Designation: E2395 – 21

Standard Specification for Voluntary Security Performance of Window and Door Assemblies with Glazing Impact[1]

This standard is issued under the fixed designation E2395; 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 specification covers performance requirements and methods of test for the resistance to forced entry of window and door assemblies. This specification addresses the capability of window and door assemblies to frustrate and potentially delay or deter opportunistic entry by unskilled and semi-skilled intruders. This specification does not address detention facilities or window and door assemblies attacked by professional, sophisticated intruders.

1.2 This specification is used for the testing of complete window and door assemblies including assault to the infill glazing. Direct assault to the infill glazing at the specified threat level is not included in other ASTM test methods that address fenestration security performance.

1.3 These requirements are limited to window and door assemblies only as manufactured, regardless of their materials or method of manufacture. They do not include requirements for secondary or storm windows and doors, doors intended for vehicular access, or skylights. This is a laboratory test, not a field test that simulates an installed condition.

1.4 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard. Certain values contained in reference documents cited and quoted herein may be stated in inch-pound units and must be converted by the user.

1.5 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E631 Terminology of Building Constructions

E1886 Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials

E1996 Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes

E2025 Test Method for Evaluating Fenestration Components and Assemblies for Resistance to Impact Energies (Withdrawn 2015)[3]

F476 Test Methods for Security of Swinging Door Assemblies

F588 Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact

F842 Test Methods for Measuring the Forced Entry Resistance of Sliding Door Assemblies, Excluding Glazing Impact

F1233 Test Method for Security Glazing Materials And Systems

2.2 *AAMA Standards:*[4]

AAMA/WDMA/CSA 101/I.S.2/A440 NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights

AAMA 1304 Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems

[1] This specification 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] The last approved version of this historical standard is referenced on www.astm.org.

[4] Available from American Architectural Manufacturers Association (AAMA), 1827 Walden Office Square, Suite 550, Schaumburg, IL 60173-4268, http://www.aamanet.org.

3. Terminology

3.1 *Definitions:*

3.1.1 General terms used in this standard specification are defined in Terminology E631.

3.1.2 Terms common to this standard specification and Test Methods E2025, F476, F588, F842 and F1233 are defined in the respective document unless defined herein.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *door slab*—a swinging door panel, blank, or leaf.

3.2.2 *interlayer*—a layer of material acting as an adhesive between plies of glazing, which adds additional performance to the finished product. For example: impact resistance, solar control, and acoustical insulation.

4. Performance Requirements

4.1 Products shall be tested to the following levels as described in Table 1.

5. Test Specimens

5.1 *Window and Door Assemblies:*

5.1.1 One test specimen for each product design seeking qualification shall be submitted.

5.1.2 Window and door assemblies tested for conformance to this specification shall be complete specimens representative of those produced by the manufacturer or fabricator. (AAMA/WDMA/CSA 101/I.S.2/A440 contains reference sizes which may prove useful in coordinating with window and door performance requirements not included in this specification.)

5.1.3 A test specimen shall be of the assembly size for which ratings are sought.

5.1.4 A test specimen shall contain the entire panel, door slab or sash configurations, locking devices, hardware, interlocking details, meeting rail details, and glazing for which rating is sought.

5.1.5 The same test specimen shall be used for each test sequence required by this specification.

5.1.6 Windows or doors tested with more than one locking device shall not qualify windows or doors with fewer locking devices regardless of size.

6. Test Methods

6.1 *Window Assemblies Forced Entry Test:*

6.1.1 Prepare the specimen as outlined in Section 9 of Test Methods F588.

6.1.2 *Hand Manipulation Test:*

6.1.2.1 Lift, push, pull or otherwise manipulate by hand the sash or panel relative to the clearances within the frame, while attempting to open the sash or panel.

6.1.2.2 This test shall be conducted continuously for five minutes.

6.1.3 Perform the tests using the desired level from Section 4 of this specification in accordance with the procedure outlined in Section 10 of Test Methods F588.

6.2 *Sliding Door Assemblies Forced Entry Test:*

6.2.1 Prepare the specimen as outlined in Section 9 of Test Methods F842.

6.2.2 Perform Hand Manipulation Test in 6.1.2.

6.2.3 Perform the tests in accordance with the procedure outlined in Section 10 of Test Methods F842.

6.3 *Swinging Door Assemblies Forced Entry Test:*

6.3.1 Prepare and test the specimen as outlined in Annex A1.

6.4 *Assembly Glazed Area Intrusion Test:*

6.4.1 Conduct missile impact testing in accordance with Test Method E1886 with no air pressure cycling.

6.4.1.1 The missile size shall be as specified in Table 1.

TABLE 1 Assembly Performance Requirements

NOTE 1—Assemblies tested to the impact requirements of Specification E1996 for any missile level automatically qualifies any lesser missile level.

Product Type	Performance Level	Performance Requirements	Glazed Area Intrusion Test (Tested to 6.4)
Window Assemblies Tested to 6.1	L1	Minimum Performance Grade 10 in accordance with Annex A1 of ASTM F588	ASTM E1996 Missile A
	L2	Grade 10 in accordance with Annex A1 of ASTM F588	ASTM E1996 Missile B
	L3	Grade 20 in accordance with Annex A1 of ASTM F588	ASTM E1996 Missile C
	L4	Grade 30 in accordance with Annex A1 of ASTM F588	ASTM E1996 Missile C
	L5	Grade 40 in accordance with Annex A1 of ASTM F588	ASTM E1996 Missile C plus ASTM F1233 Class 1
Sliding Door Assemblies Tested to 6.2	L1	Minimum Performance Grade 10 in accordance with Annex A1 of ASTM F842	ASTM E1996 Missile A
	L2	Grade 10 in accordance with Annex A1 of ASTM F842	ASTM E1996 Missile B
	L3	Grade 20 in accordance with Annex A1 of ASTM F842	ASTM E1996 Missile C
	L4	Grade 30 in accordance with Annex A1 of ASTM F842	ASTM E1996 Missile C
	L5	Grade 40 in accordance with Annex A1 of ASTM F842	ASTM E1996 Missile C plus ASTM F1233 Class 1
Swinging Door Assemblies Tested to 6.3	L1	Minimum Performance Grade 10 in accordance with ASTM F476	ASTM E1996 Missile A 2g small missile
	L2	Grade 10 in accordance with ASTM F476	ASTM E1996 Missile B
	L3	Grade 20 in accordance with ASTM F476	ASTM E1996 Missile C
	L4	Grade 30 in accordance with ASTM F476	ASTM E1996 Missile C
	L5	Grade 40 in accordance with ASTM F476	ASTM E1996 Missile C plus ASTM F1233 Class 1