



Designation: F2090 – 21

Standard Specification for Window Fall Prevention Devices With Emergency Escape (Egress) Release Mechanisms¹

This standard is issued under the fixed designation F2090; 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.

INTRODUCTION

This consumer safety specification addresses window fall prevention devices that protect against potential falls by children aged five years and under through open windows. Window fall prevention devices currently available include window opening control devices (WOCs), window fall prevention screens, and some types of window guards. These devices use different strategies to prevent children from falling through open windows. Window opening control devices (WOCs) restrict the size of the open area of the window so that it is too small for a young child to fall through. They do this by allowing the window opening to be set at a predetermined position. Window fall prevention screens and fall prevention window guards provide a barrier to prevent a child from falling through an open window.

A special study² by the U.S. Consumer Product Safety Commission (CPSC) indicates that young children are at risk of death and serious injury from falls through open windows. Children aged five and younger account for a higher percentage of window fall fatalities and injuries.³

Window fall prevention devices usually differ in purpose and application from security/burglar bars. The general purpose of a window fall prevention device is to prevent a child age five or younger from falling through an open window. The general purpose of a security bar is to prevent unlawful entry through a window. Generally, window fall prevention devices and security bars are two separate devices. Security bars are generally permanently in place, cannot be released, and therefore would not be considered a window fall prevention device under this standard.

The CPSC has advised caregivers to open windows less than 4 in. when children are present as one means to prevent child falls through open windows. Window opening control devices (WOCs) provide a means that the window, when opened in an initial operation, will satisfy the CPSC recommendation to open less than 4 in.⁴ The 4-in. dimension is drawn from related building codes and standards for openings in guardrail assemblies,⁵ and is universally accepted as the appropriate dimension to prevent a child from passing through balcony or guard railing systems. An additional operation is required to open the window further. The additional operation must be performed without the use of keys, tools, or special knowledge. Security from forced entry is not within the scope of this standard and is not the intended function of any of the devices referred to herein.

The intent of this update to this standard is to add new subsections 1.4 and 1.5 to the Scope section for window manufacturers who rely on supplier test reports and to clarify that all the applicable requirements of the standard must be met to claim conformance to this standard. Another update is to improve the clarity in 9.3.3 regarding the visibility of operating mechanisms and correct a typo in 12.2 replacing “hand tag” with “hang tag.”

1. Scope

1.1 This specification establishes requirements for devices intended to address the risk of injury and death associated with accidental falls through open windows by children five years old and younger.

1.2 This specification is not intended to meet the unique requirements of Americans With Disabilities Act (ADA).

1.3 This specification applies to window fall prevention devices, including window opening control devices (WOCDs), window fall prevention screens, and fall prevention window guards, that are to be used on operable windows, including those that are designated for emergency escape (egress) and rescue (ingress).

NOTE 1—A separate safety specification, Safety Specification **F2006**, covers window fall prevention devices for non-emergency escape (egress) and rescue (ingress) windows in installations more than 75 ft⁶ (23 m) above ground level in multiple family dwelling buildings since windows at these heights are beyond the reach of rescue ladders currently in use.

1.4 Window manufacturers who rely on a test report from the supplier of the window fall prevention device shall verify that the installation of the window fall prevention device (either installed by the window manufacturer prior to shipping of the window or provided by the window manufacturer as a field installed kit) on their specific window product operator type complies with this standard.

1.5 Partial compliance to this standard is not permitted. In order to claim compliance to this standard, all of the applicable requirements in the standard must be met.

1.6 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.7 *This standard does not purport to address all 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 to determine the applicability of regulatory limitations prior to use.*

¹ This specification is under the jurisdiction of ASTM Committee **F15** on Consumer Products and is the direct responsibility of Subcommittee **F15.38** on Window Fall Prevention.

Current edition approved June 1, 2021. Published July 2021. Originally approved in 2001. Last previous edition approved in 2017 as F2090 – 17. DOI: 10.1520/F2090-21.

² U.S. Consumer Product Safety Commission, *Special Window Falls Study*, conducted in 1991.

³ U.S. Consumer Product Safety Commission, *Special Window Falls Study*, conducted in 1991 and “Window Safety: Data and Patterns Related to Entrapments and Accidental Falls from Windows,” prepared by Andersen Corporation.

Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR:F15-1002. Contact ASTM Customer Service at service@astm.org.

⁴ Consumer Product Safety Commission, “Preventing Window Falls,” Document #5124.

⁵ See NFPA 101, 2012 Edition, Section 7.2.2.4.5.3. Also see Section R312.1.3 guard opening limitations in the 2018 and 2021 International Residential Code (IRC).

⁶ 2006 *International Building Code*, Section 403.1, Special Provisions for Groups B and R1, January 2000. See 2021 International Building Code, Section 202, definition for High-Rise Building.

1.8 *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:⁷

F977 Consumer Safety Specification for Infant Walkers
F1487 Consumer Safety Performance Specification for Playground Equipment for Public Use

F2006 Safety Specification for Window Fall Prevention Devices for Non-Emergency Escape (Egress) and Rescue (Ingress) Windows

2.2 Code of Federal Regulations:⁸

16 CFR 1500.53 Test Methods for Simulating Use and Abuse of Toys and Other Articles Intended for Use by Children Over 36 But Not Over 96 Months of Age, (f)(3) Testing Procedure

16 CFR 1508.6(b) Requirements for Full-Size Baby Cribs
CPSC 16 CFR Chapter II Part 1201 Safety Standard for Architectural Glazing Materials

2.3 ANSI Standards:⁹

ANSI Z535.4 Product Safety Signs and Labels

ANSI Z535.6 Product Safety Instructions in Product Manuals, Instructions and Other Collateral Materials

ANSI Z97.1 Safety Glazing Materials Used in Buildings — Safety Performance Specifications and Methods of Test (Tempered Glass Impact Test)

ANSI/BHMA A156.9 American National Standard for Cabinet Hardware

ANSI/SMA 1201 Specification for Insect Screens for Windows, Sliding Doors and Swinging Doors

2.4 AAMA Standards:¹⁰

AAMA/WDMA/CSA 101/IS.2/A440 North American Fenestration Standard/Specification for Windows, Doors, and Skylights (NAFS)

AAMA 902 Voluntary Specification for Sash Balances

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *aftermarket, adj*—referring to a product or device that is manufactured separately from a window but is intended to be used in conjunction with a window; for purposes of this standard, such a device is intended to be attached to or near a

⁷ 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.

⁸ *Code of Federal Regulations*, available from U.S. Government Printing Office, Washington, DC 20402.

⁹ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

¹⁰ Available from American Architectural Manufacturers Association, 1900 E. Golf Road, Suite 1250, Schaumburg, IL 60173, <http://www.aamanet.org/index.asp>.

window or its frame in order to prevent a young child from passing or falling through the window when the window is opened.

3.1.2 *emergency escape (egress) and rescue (ingress) window, n*—a window intended for emergency escape (egress) and rescue (ingress) during an emergency situation such as fire, gas leak, etc., as defined by the prevailing applicable building and fire codes.

3.1.3 *fall prevention window guard, n*—device designed to fit into or onto a window to prevent a child from passing or falling through an open window; typically mounted on the interior frame of the window and includes side frames fastened to the sides of a window frame and a plurality of spaced-apart, transverse, tubular, width-adjustable crosspiece elements to form a grid pattern between the side supports to prevent passage of a child. See [Appendix X3](#) for examples.

3.1.4 *release mechanism for emergency escape (egress) and rescue (ingress) window fall prevention device, n*—means of opening a window fall prevention screen or fall prevention window guard or releasing a window opening control device (WOCD) to provide a clear opening space for the purpose of emergency escape or rescue.

3.1.5 *window, n*—an opening constructed in a wall or a roof to admit light or air, or both, to any enclosure.

3.1.6 *window fall, n*—a fall through an open window.

3.1.7 *window fall prevention device, n*—any device intended to prevent a young child from passing or falling through an open window; such a device may be an integral part of a window, or may be attached to the window, its frame, or the area around the window after the window has been installed.

3.1.8 *window fall prevention screen, n*—screen device designed to fit into or onto a window to prevent a child from passing or falling through an open window; typically mounted on the exterior surface/frame of a sliding style window and on the interior of a cranking style window and includes screening mesh or material and attachment mechanism(s) of sufficient strength to meet the performance requirements of this standard while preventing passage of a child. See [Appendix X4](#) for examples.

3.1.9 *window opening control device (WOCD), n*—device that controls a window sash opening to be opened with normal operation of the sash such as to prohibit the free passage of a 4.0-in. (102-mm) diameter rigid sphere¹¹ at the lowest opening portion of the window opening, with a release mechanism that shall allow the sash to be opened to a larger opening area such as that required for emergency escape and rescue, and that automatically resets when the window sash is fully closed. See [Appendix X5](#) for examples.

3.1.9.1 *controlled open position, n*—maximum open position of a window sash, when the window opening control device(s) (WOCD(s)) is engaged, that prohibits the free passage of a 4-in. (102-mm) diameter rigid sphere.

¹¹ CPSC Publication 362, “Safety Barrier Guidelines for Home Pools” and New Jersey Community Affairs Division of Codes and Standards, Cite 27 N.M.R. 3150, Subchapter 27 Child-Protection Window Guards — 5:10 — 27.4 — Specifications for Window Guards.

WINDOW FALL PREVENTION SCREENS AND FALL PREVENTION WINDOW GUARD DEVICES

4. General Requirements

4.1 Window fall prevention screens or fall prevention window guard devices shall be constructed so as to prohibit the free passage of a 4.0-in. (102-mm) diameter rigid sphere¹² anywhere in the window opening (as required by applicable codes for that jurisdiction), during or after testing as specified in [5.1 – 5.4](#), when the window fall prevention screen or fall prevention window guard device is installed in accordance with the manufacturer’s instructions.

4.2 The distance between window fall prevention screen or fall prevention window guard device structural members or components after all testing is conducted shall not exceed 4.0 in. (102 mm) when a 60-lbf¹³ (267-N) direct force is applied in accordance with the test method in [5.2](#).

4.3 Releasable window fall prevention screen or fall prevention window guard devices shall be free of sharp projections and edges.

4.4 Releasable window fall prevention screens or fall prevention window guard devices shall not interfere with the operation, function or performance of the window to applicable standards and shall not violate light, ventilation, and emergency escape and rescue requirements of the applicable building code.

4.5 Window fall prevention screens or fall prevention window guard devices shall be designed with release mechanisms to allow for emergency escape (egress) without the need for special tools or special knowledge.

4.5.1 Operation of emergency escape (egress) mechanisms shall be accomplished with a minimum amount of effort from the inside of the building, whether the window fall prevention screen and fall prevention window guard device is mounted inside or outside the building.

4.5.2 Release of the emergency escape (egress) mechanism shall require no more than 15 lbf (66 N) of force.¹⁴

4.5.3 To protect against inadvertent operation by a young child, the emergency escape (egress) release mechanism(s) shall require two distinct actions to operate.¹⁵ Opening the window fall prevention screen or fall prevention window guard shall not count as one of these actions.

4.5.4 The emergency escape (egress) release mechanism shall operate properly in all types of weather.

4.5.5 Emergency escape (egress) releases shall have their operating mechanisms clearly identified for proper use in an emergency.

¹² CPSC Publication 362, “Safety Barrier Guidelines for Home Pools” and New Jersey Community Affairs Division of Codes and Standards, Cite 27 N.M.R. 3150, Subchapter 27 Child-Protection Window Guards — 5:10 — 27.4 — Specifications for Window Guards.

¹³ “Anthropometry of Infants, Children, and Youths to Age 18 for Product Safety Design,” Highway Safety Research Institute, University of Michigan, May 31, 1977.

¹⁴ 16 CFR 1500.53, Test Methods for Simulating Use and Abuse of Toys and Other Articles Intended for Use by Children Over 36 But Not Over 96 Months of Age, (f)(3) Testing Procedure.

¹⁵ 16 CFR 1508.6(b), Requirements for Full-Size Baby Cribs.