



Designation: **F2175—07 (Reapproved 2015) F2175 – 23**

Standard Specification for Portable and Permanent Emergency Escape Ladders for Residential Use¹

This standard is issued under the fixed designation F2175; 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 establishes recognized performance requirements for portable and permanent emergency escape ladders for residential use.

1.2 This specification replaces provisional standard PS 117.

1.3 *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 ~~consult and establish appropriate safety and health~~ safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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

D648 Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position

2.2 *Underwriters Laboratories Standard:*³

UL 746b Oven Aging Techniques

3. Requirements

3.1 The ladder shall show evidence of good workmanship and meet the following requirements:

3.1.1 *Vertical Static Load*—The ladder components shall not allow evidence of failure (material or joint separation, cracking, or collapse) when tested in accordance with ~~4.14.2~~.

3.1.2 *Horizontal Static Load*—The ladder components shall not show evidence of failure (material or joint separation, cracking, or collapse) when tested in accordance with ~~4.24.3~~.

3.1.3 *Rung/Step Strength*—The rungs/steps shall not show any evidence of failure (material or joint separation, cracking, or collapse) when tested in accordance with ~~4.34.4~~.

¹ This specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.47 on Fire Ladders. Current edition approved April 1, 2015 Aug. 1, 2023. Published August 2015 December 2023. Originally approved in 1999 as PS 117, which was adopted as F2175 in 2002. Last previous edition approved in 2007 2015 as F2175—07 F2175 – 07 (2015). DOI: 10.1520/F2175-07R15.10.1520/F2175-23.

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 Available from Global Engineering Documents, IHS, 15 Inverness Way East, Englewood, CO 80112, <http://www.global.ihs.com>.

3.1.4 *Rung/Step/Side Support Shear*—The rungs/steps and side support shall not show evidence of failure (material or joint separation, cracking, or collapse) when tested in accordance with [4.4.5](#).

3.1.5 *Deployment Weight*—Maximum weight of the ladder shall be less than or equal to 20 lb (9.0 kg) for a ~~20-ft (5.1-m)~~ 20 ft (5.1 m) ladder and not more than 0.75 ~~ft (0.34 lb)~~ (0.34 kg) per foot (30 cm) of additional length.

3.1.6 *Deployment Time*—Deployment of the ladder shall be less than ~~60 s~~ 60 s as tested in accordance with [4.5.6](#).

3.1.7 *Hook or Attachment Stability*—The unit shall have hooks or other means of attachment to the window or permanent structural attachment that are stable. With the ladder in place, no hazardous condition shall be created when tested in accordance with [5.4.7](#).

3.1.8 *Rung/Step Size*—Rungs/steps shall be 0.97 in. (25 mm) minimum in depth and greater than 10 in. (254 mm) in width. For rungs made from round tubing, the minimum rung depth can be reduced at each end for attachment to side supports.

3.1.9 *Rung/Step Release Mechanism*—For ladders having rung/step release mechanisms, the pull force to release and deploy the ladder shall be 5 lb (2.3 kg) or less.

3.1.10 *Heat Deflection Temperature*—All materials that soften or melt by heat used in support components of the ladder including the rungs, rung supports, and hooks, shall have a heat deflection temperature, as measured by Test Method [D648](#), of not less than ~~150°C~~ 150 °C at 66 psi (455 kPa).

3.1.11 *Standoff*—Standoffs for each rung/step shall be supplied with each ladder. Minimum distance between the outer face of the rung/step and standoff contact at building shall be not less than 3.6 in. (9.1 cm). If standoffs are shipped unattached, the label shown in Section 5 shall be used on opposite sides of the final package.

3.1.12 *Designed Length*—Designed for a maximum use of ~~3~~ three (3) stories (unless specified ~~otherwise~~) for less than three stories.

3.1.13 *Rung/Step Spacing*—Rungs/steps shall be spaced at a uniform distance and spaced at intervals of ~~13 ± 2 in.~~ 13 in. ± 2 in. (325 cm ± 5 cm).

3.1.14 *Rungs/Steps*—Rungs/steps are to be corrugated, serrated, knurled, dimpled, embossed, or coated with slip-resistant material.

3.1.15 *Rated Load*—The rated load shall be indicated for each ladder and shall be rated at 250 lb or more.

3.1.16 *Stress Relief*—Rungs/steps, rung/step supports, hooks or permanent structural attachment assembly shall stand conditioning at ~~70°C~~ 70 °C for 7 h without significant deformation or any cracking that would, in any way, adversely affect the functionality of the ladder.

3.1.17 *Heat Aging*—Polymeric components shall have a calculated use temperature of ~~75°C~~ 75 °C or more when heat aged according to UL 746b or shall be heat aged at ~~100°C~~ 100 °C for 1000 h without a 25 % or more decrease (unaged to aged) in tensile properties.

4. Test Methods

4.1 Test Fixture—A test fixture that represents the type(s) of window openings specified for the product shall be used to conduct the tests of [4.2](#), [4.3](#), [4.4](#), [4.5](#), and [4.7](#).

4.2 Vertical Static Load Test—The ladder shall be mounted as intended and subjected to a vertical static load of three times the rated load to evaluate the hook or anchoring, rung/step, and rung/step support components. The loads shall be evenly distributed along length of the ladder, with a maximum of 250 lb (113 kg) per rung, for 1 min. Following the test, With the loads applied, the ladder shall be examined for evidence of failure, remain attached to the test fixture with no breakage, separation of components, or any other failure. The ladder hooks shall remain below the window sill, not creating any hazardous conditions with respect to the attachment to the permanent structure.