



Standard Safety Specification for Components, Assembly, Use, and Labeling of Consumer Trampolines¹

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1. Scope

1.1 This safety specification covers the components, the assembly, and the use of consumer trampolines.

1.2 This specification is delimited in its application to trampolines of (1) a minimum bed size of 3300 in.² (21 300 cm²), (2) a minimum height of 20 in. (51 cm), (3) intended for the purpose of continuous, vertical jumping activities and (4) intended for consumer use.

1.3 This specification is intended to reduce the demonstrated hazards associated with the use of trampolines by consumers. Trampolines primarily used by consumers are in home environments. This specification is not intended to apply to institutional trampolines. Trampolines that adhere to this specification are not recommended for use by children under six years of age.

1.4 *This standard does not purport to address all of the hazards associated with trampolines. The standard's existence alone will not necessarily prevent injuries. Like other physical activities, trampoline use involves the risk of injury, particularly if the equipment is used improperly.*

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

1.6 The primary units given in this specification are in the inch-pound system.

1.7 This specification includes the following sections and selected subsections.

Title	Section Number
Scope	1
Referenced Documents	2
Terminology	3
Included Components	4
Materials and Manufacture	5
Environmental Conditioning	5.2.1
UV Exposure	5.2.1.1
Performance Requirements	6
Drop Test	6.2

Drop test weight and impactor shape.	6.2.1
Drop test procedure.	6.2.2
Padding Attachment System Strength	6.3
Padding Attachment System Strength Test Procedure	6.3.1
Information Packet:	7
Packet Marketing and Contents	7.1
Assembly and Installation Instructions	7.2
Care and Maintenance Instructions	7.3
Warning Information	7.4
Use Instructions	7.5
Product Marking:	8
Identification	8.1
On-Trampoline Warnings	8.2
Instruction Sign	8.3
Packaging and Package Marking	9
Access Devices:	10
Trampoline Ladders	10.1
Ladder Warning	10.2
Keywords	11
Appendix	

2. Referenced Documents

2.1 ASTM Standards:

F 355 Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials²

G 154 Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials³

G 155 Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials³

2.2 Other Standard:

ANSI Standard Z535.4 Product Safety Signs and Labels⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *access device, n*—a device used for access to or egress from a trampoline bed including, but not limited to, trampoline ladders.

3.1.2 *bed, n*—flexible surface which the user contacts in the course of bouncing on a trampoline.

3.1.3 *bouncing, n*—the action considered as normal use of a trampoline consisting of continuous, vertical jumping wherein each landing is in near proximity to the previous landing.

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² *Annual Book of ASTM Standards*, Vol 15.07.

³ *Annual Book of ASTM Standards*, Vol 14.04.

⁴ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

3.1.4 *consumer trampoline, n*—a trampoline intended for use in a home environment.

3.1.5 *folding-type trampoline, n*—a trampoline whose frame can be folded when not in use. See *portable*.

3.1.6 *frame, n*—the framework constructed of rigid supportive materials from which the bed is suspended.

3.1.7 *frame padding, n*—shock-attenuating protective device(s) that attaches to the frame to cover the frame and suspension system.

3.1.8 *institutional trampoline, n*—a trampoline intended for use in a commercial or institutional facility.

3.1.9 *ladder, n*—see *trampoline ladder*.

3.1.10 *legs, n*—the framework constructed of rigid materials which support the frame above the ground or floor.

3.1.11 *mat, n*—a common, though nonpreferred term referring to bed.

3.1.12 *portable, adj*—able to be easily moved without disassembly, though usually requiring the assistance of devices such as roller stands. Folding-type trampolines are often intended to be portable.

3.1.13 *roller stand, n*—a device that is used to assist in rolling/moving a folding-type trampoline frame.

3.1.14 *suspension system, n*—the bed-supporting system made up of elastic devices that connect the bed to the frame, for example, steel extension springs.

3.1.15 *trampoline, n*—a rebound device activated by vertical jumping, upon which gymnastics skills and exercises are performed.

3.1.16 *trampoline ladder, n*—a ladder-like device specifically designed for use with a trampoline and designed to be easily removable.

4. Included Components

4.1 When a trampoline is offered for sale, it shall include the following: (1) a frame, (2) a bed, (3) a suspension system, (4) frame padding, (5) an information packet, and (6) suitable markings.

4.2 When a trampoline is offered for sale, a trampoline ladder shall not be included as a component part or within the same packaging.

4.3 When a portable trampoline is offered for sale, it shall include all of the components in 4.1 plus appropriate roller stands.

4.3.1 For folding-type trampolines, the information in 7.5.1 and 8.3.3 shall also include the following:

4.3.1.1 Use two or more strong people to open and close folding-type trampolines.

5. Materials and Manufacture

5.1 The suspension system shall be designed so as to protect the performer from injury due to contact with the sharp ends of the trampoline springs.

5.2 The frame padding shall be designed to remain securely attached to the frame when tested to the requirements of 6.2. All tests shall be conducted at ambient temperatures (nominally 68 v 5°F (20 v 3°C)).

5.2.1 *Environmental Conditioning*—Materials used in the pad cover, frame padding, cover attachments, tie down(s), and pad seams shall pass the tests specified in 6.3 after separately

conditioning test samples as specified in 5.2.1.1. Tests in 5.2.1.1 are applicable to those areas of the frame padding attachments, and tie downs normally exposed to sunlight. A minimum of three samples will be used for each conditioning environment.

5.2.1.1 *UV Exposure*—Pad cover, cover attachments, tie down(s), and pad seams that are exposed to sunlight shall be exposed to 120 h of UV light. The UV light exposure shall be conducted in accordance with either Practice G 154 or Practice G 155 using spectral irradiance corresponding to daylight conditions. After exposure, the samples shall be tested as specified in 6.3.

5.3 Except for necessary seams, the frame padding shall cover the entire top surface of the frame and be wide enough to completely cover the entire top surface of the suspension system and frame when subjected to the tests specified in 6.2.

5.4 The frame padding shall be of a color which contrasts with the color of the trampoline bed.

5.5 Height of the bed from the ground or floor shall be sufficient to prevent the bed from contacting the ground or floor while bouncing.

5.6 The trampoline shall be designed such that no part of the frame or legs can be contacted by the bed while bouncing.

5.7 All information, instructions, and warnings shall be provided in English in addition to any other formats used, for example, graphical, video, multilingual, etc.

6. Performance Requirements

6.1 The shock-attenuating material used in the frame padding, as measured to include the frame and a minimum of 2 in. from the inside edge of the frame, shall limit the severity index to less than 450, when the same thickness as used in the frame padding is tested in accordance with Test Method F 355 using a 20-lb (9-kg), 20-in.² (129-cm²) round, flat head dropped from a distance of 2 ft (61 cm).

6.2 *Drop Test*—A drop test will be performed on the frame padding attached to a trampoline and assembled in accordance with the manufacturer's instructions. The drop test shall use the equipment and procedures described in 6.2.1 and 6.2.2. As a result of the test:

(1) The impactor shall not tear the cover or completely penetrate the padding;

(2) Seams of the padding shall not separate;

(3) The pad attachments shall not separate from the pad or frame; and

(4) The padding shall continue to cover the frame, springs, and frame hardware when the impactor is removed from the surface of the padding.

6.2.1 *Drop test weight and impactor shape*. The drop weight will consist of a 23-kg (50-lb) mass with a wooden impacting surface. See . The edges of the impact surface are radiused and the heel and toe of the surface are contoured as shown in .

6.2.2 *Drop test procedure*. The impactor shall be dropped in a guided free-fall to contact the surface of the padding. The surface of the impactor shall be flat and parallel (within 5 degrees) to the surface of the padding on the initial contact with the pad. The impactor shall be dropped on the portion of the padding covering the springs. The impactor shall be centered to impact at a location midway between the inner edge of the

frame rail and the edge of the trampoline bed. The impactor shall be raised to a height of 12 in. (tolerance $-0/+5$ in.) [305 mm ($-0/+13$ mm)] above the surface of the padding. The impactor shall be dropped at a minimum of 2 times near each of the following locations - consistent with the required spacing centered between the springs:

- (1) Midway between attachment points;
- (2) Adjacent to an attachment point;
- (3) At a pad seam.

After the first impact, the impactor shall be raised to its initial drop height. The results of the test with regard to pad integrity and coverage will be assessed. The padding shall not be disturbed after removal of the impactor. The impactor is dropped a second time and the results recorded.

6.3 Padding Attachment System Strength—The residual tensile strength of the padding attachment system shall not decrease by more than 20 % after the conditioning specified in 5.2.1 when tested in accordance with 6.3.1. (The padding attachment system consists of the tie down material, fastening mechanisms, and methods of attachment to the frame and pad covering.)

6.3.1 Padding Attachment System Strength Test Procedure—At a location on the padding adjacent to the point of attachment of the padding tie down(s), clamp a section of the padding cover material in the jaws of a tensile test fixture or adjustable clamp. The clamping jaws shall have a width that is at least 25 % larger than the width of the attachment. Attach the other end of the tie down in a manner similar to its attachment to the frame. Ensure that all fastening mechanisms are connected in accordance with the instructions supplied by the manufacturer. For “tied” connections, a square knot shall be used unless the manufacturer specified another knotting procedure. Apply a tensile force of 1 in./min (25 mm/min) until failure of the tie down material, fastening mechanism, or point of attachment. Test shall be run on attachments at and away from seams if they are part of the construction of the pad.

7. Information Packet

7.1 Packet Marking and Contents:

7.1.1 Each trampoline shall be accompanied by a separate packet of materials, with the following notice:

Assembly, Installation, Care, Maintenance, and Use Instructions

WARNING

Read these materials prior to assembling and using this trampoline

7.1.1.1 This notice shall, without font or layout being implied, be well highlighted, and in enlarged boldface type in contrast to other text.

7.1.2 The packet shall contain: (1) assembly instructions, (2) care and maintenance instructions, (3) warning information, and (4) use instructions.

7.2 Assembly and Installation Instructions:

7.2.1 The manufacturer’s assembly instructions for the trampoline shall be clearly written and presented such that the trampoline can be properly and safely assembled.

7.2.2 The manufacturer’s assembly instructions shall emphasize the importance of properly attaching the frame padding securely to the frame and in correct position prior to using the trampoline. The manufacturer shall provide a diagram illustrating the correct placement of the frame padding relative to the frame.

7.2.3 Any specific use limitations placed on the trampoline by the manufacturer shall be included in a statement appearing in a box at the bottom of the first page after the following notice:

WARNING

7.2.4 Trampoline installation instructions shall be supplied by the manufacturer to aid the purchaser in proper installation and placement of the trampoline. The installation instructions shall include the following information:

7.2.4.1 Adequate overhead clearance is essential. A minimum of 24 ft from ground level is recommended. Provide clearance for wires, tree limbs, and other possible hazards.

7.2.4.2 Lateral clearance is essential. Place the trampoline away from walls, structures, fences, and other play areas. Maintain a clear space on all sides of the trampoline.

7.2.4.3 Place the trampoline on a level surface before use.

7.2.4.4 Use the trampoline in a well-lighted area. Artificial illumination may be required for indoor or shady areas.

7.2.4.5 Secure the trampoline against unauthorized and unsupervised use.

7.2.4.6 Remove any obstructions from beneath the trampoline.

7.2.4.7 The owner and supervisors of the trampoline are responsible to make all users aware of practices specified in the use instructions.

7.3 Care and Maintenance Instructions:

7.3.1 Trampoline care and maintenance instructions shall be supplied by the manufacturer to aid the purchaser in the basic and proper care and maintenance of the trampoline.

7.3.2 The manufacturer’s care and maintenance instructions for the trampoline shall contain the following information:

7.3.2.1 Inspect the trampoline before each use and replace any worn, defective, or missing parts. The following conditions could represent potential hazards:

7.3.2.1.1 Missing, improperly positioned, or insecurely attached frame padding,

7.3.2.1.2 Punctures, frays, tears, or holes worn in the bed or frame padding,

7.3.2.1.3 Deterioration in the stitching or fabric of the bed or frame padding,

7.3.2.1.4 Ruptured springs,

7.3.2.1.5 A bent or broken frame,

7.3.2.1.6 A sagging bed, or

7.3.2.1.7 Sharp protrusions on the frame or suspension system.

7.4 Warning Information:

7.4.1 All warnings in the information packet shall: (1) be readily visible, (2) alert the reader to the potential hazard in time to take the appropriate action, and (3) have good pictorial, word and message legibility.