



Designation: F2970 – 22

Standard Practice for Design, Manufacture, Installation, Operation, Maintenance, Inspection and Major Modification of Trampoline Courts¹

This standard is issued under the fixed designation F2970; 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 The purpose of this practice is to delineate requirements regarding the design, manufacture, installation, operation, maintenance, inspection and major modification of commercial or institutional trampoline courts with the primary purpose of amusement, entertainment or recreation.

1.2 This standard applies to institutional trampoline courts that are located in and around amusement, entertainment or recreational facilities. Such facilities include but are not limited to trampoline parks, amusement parks, theme parks, water parks, family entertainment centers, fitness centers, gyms, gymnastics facilities, sports facilities, skate parks, camps, shopping centers, temporary special events, carnivals and municipal parks.

1.3 This standard applies to devices manufactured on or after the date of publication of this standard practice.

1.4 This practice establishes guidelines that will provide a level of conformity for the purpose of reducing potential hazards to patrons, court attendants, and spectators.

1.5 This standard does not purport to address all of the hazards associated with institutional trampoline courts. The standard's existence alone will not prevent injuries. Like other physical activities, institutional trampoline court use involves the risk of injury, particularly if the equipment is used improperly or if users exceed their capabilities, endurance, training, or experience.

1.6 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.7 This practice includes an annex (mandatory), which provides additional information (for example, rationale, background, interpretations, drawings, commentary, and so forth) to improve the user's understanding and application of

the criteria presented in this practice. The annex information shall be interpreted as mandatory criteria.

1.8 This practice includes an appendix (non-mandatory), which provides additional information (for example, rationale, background, interpretations, drawings, commentary, and so forth) to improve the user's understanding and application of the criteria presented in this practice. The appendix information shall not be interpreted as mandatory criteria.

1.9 This standard includes the following sections:

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1.10 *Units*—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.

1.11 *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.*

1.12 *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.*

¹ This practice is under the jurisdiction of ASTM Committee F24 on Amusement Rides and Devices and is the direct responsibility of Subcommittee F24.61 on Adventure Attractions.

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2. Referenced Documents

2.1 *ASTM Standards:*²

- D737** Test Method for Air Permeability of Textile Fabrics
D3574 Test Methods for Flexible Cellular Materials—Slab, Bonded, and Molded Urethane Foams
D3786 Test Method for Bursting Strength of Textile Fabrics—Diaphragm Bursting Strength Tester Method
D3787 Test Method for Bursting Strength of Textiles—Constant-Rate-of-Traverse (CRT) Ball Burst Test
D4533 Test Method for Trapezoid Tearing Strength of Geotextiles
D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles
D4833 Test Method for Index Puncture Resistance of Geomembranes and Related Products
D5034 Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
D5672 Test Method for Testing Flexible Cellular Materials Measurement of Indentation Force Deflection Using a 25-mm [1-in.] Deflection Technique
D6413 Test Method for Flame Resistance of Textiles (Vertical Test)
E84 Test Method for Surface Burning Characteristics of Building Materials
E648 Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
F355 Test Method for Impact Attenuation of Playing Surface Systems, Other Protective Sport Systems, and Materials Used for Athletics, Recreation and Play
F747 Terminology Relating to Amusement Rides and Devices
F770 Practice for Ownership, Operation, Maintenance, and Inspection of Amusement Rides and Devices
F1193 Practice for Quality, Manufacture, and Construction of Amusement Rides and Devices
F2291 Practice for Design of Amusement Rides and Devices
F2374 Practice for Design, Manufacture, Operation, and Maintenance of Inflatable Amusement Devices
F2375 Practice for Design, Manufacture, Installation and Testing of Climbing Nets and Netting/Mesh used in Amusement Rides, Devices, Play Areas and Attractions
F2650 Terminology Relating to Impact Testing of Sports Surfaces and Equipment

2.2 *AISC Manuals:*³

- AISC 316** Manual on Steel Construction, Allowable Stress Design (ASD)
AISC M015 Manual on Steel Construction, Load & Resistance Factor Design (LRFD)

2.3 *AWS Standards:*⁴

- ANSI/AWS D1.1/D1.1M** Structural Welding Code—Steel

- ANSI/AWS D14.4** Specification for Welded Joints in Machinery and Equipment

2.4 *NFPA Standards:*⁵

- NFPA 70** National Electrical Code (NEC)
NFPA 701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
NFPA 705 Recommended Practice for a Field Flame Test for Textiles and Films

2.5 *State Documents:*

- California Technical Bulletin 117** Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials
Title 19 California Code of Regulation, Flame Retardant Regulations⁶

3. Terminology

- 3.1 Reference Terminology **F747**.

- 3.2 Reference Terminology **F2650**.

3.3 *Definitions of Terms Specific to This Standard:*

3.3.1 *assembly area, n*—a designated area primarily used for mounting or dismounting the trampoline court.

3.3.2 *children zone, n*—a trampoline court, an area within a trampoline court, or an area adjacent to a trampoline court designated by the designer/engineer, manufacturer, or owner/operator primarily for use, activity, entry, or dismount by young children.

3.3.3 *court attendant, n*—individual trained in facility emergency procedures, familiar with fundamental trampolining and TC foam pit operations, monitoring patrons and responding to TC trampoline, and TC foam pit emergencies.

3.3.4 *dismount platform, n*—any surface for standing, walking, sitting, or climbing, or a flat surface larger than 2.0 in. (51 mm) wide by 2.0 in. (51 mm) long having less than 30° angle from horizontal.

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

3.3.6 *redundant barrier net, n*—net or mesh intended as secondary containment under or behind an elevated surface that helps passively contain the user(s) within the bounded area.

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

3.3.8 *trampoline court foam pit or TC foam pit, n*—a combination style dismount pit designed with a rebound device, covered with loose impact absorbing blocks.

3.3.9 *trampoline court trampoline or TC trampoline, n*—rebound device activated by vertical or lateral jumping used in a trampoline court.

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 American Institute of Steel Construction (AISC), One E. Wacker Dr., Suite 700, Chicago, IL 60601-2001, <http://www.aisc.org>.

⁴ Available from American Welding Society (AWS), 550 NW LeJeune Rd., Miami, FL 33126, <http://www.aws.org>.

⁵ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, <http://www.nfpa.org>.

⁶ Available from Office of Administrative Law, 300 Capitol Mall, Suite 1250, Sacramento, CA 95814-4339, <http://www.oal.ca.gov/Default.htm>.

3.3.10 *trampoline court bed or TC bed, n*—flexible surface which the user contacts in the course of bouncing on a trampoline.

3.3.11 *trampoline court or TC, n*—a defined area comprising one or more institutional trampolines or a series of institutional trampolines.

4. Significance and Use

4.1 This practice is intended to provide consistent criteria, references and operational considerations in the specifications, management and construction of institutional trampoline courts.

4.2 This practice is intended to be taken into consideration by architects, designers, engineers, construction contractors, manufacturers, appropriate inspectors, owners and operators who are involved with the design, construction, manufacture, installation, operation, maintenance, inspection or major modification of institutional trampoline courts.

4.3 This practice does not apply to consumer trampolines, trampolines intended for use on water, trampolines intended for use as aquatic play equipment, trampolines primarily used for professional exhibition, or single user trampolines primarily used under the direct supervision of a trainer or coach.

4.4 This standard does not apply to stand alone institutional trampoline units that consist of one or more individual stations with a total bed area less than 37 000 in.² (238 709.2 cm²) and employ a mechanical harnessed system to control or direct the descent of a patron.

4.5 This standard does not apply to stand alone institutional trampoline units that consist of one or more individual stations with a total bed area less than 37 000 in.² (238 709.2 cm²) and employ individual chambers divided with small mesh netting to control or direct the descent of a patron.

4.6 This standard does not apply to inflatable amusement devices covered by Practice [F2374](#).

4.6.1 This standard applies to trampoline courts that mount or dismount onto an inflatable impact attenuation system.

4.7 Trampoline courts that employ a device designed to introduce additional energy into the suspension or bed system are outside the scope of this standard practice.

4.8 For the purpose of this standard, consideration shall be given within the design and for operation of a trampoline court with activities including but not limited to: bouncing, jumping, walking, standing, sitting, resting, acrobatic maneuvers, aerobics, flips, dancing, exercise, therapeutic rehabilitation, dodgeball, basketball, or volleyball.

4.9 For the purpose of this standard, consideration shall be given within the design and for operation of a trampoline court with complementary equipment including but not limited to: foam balls, inflated balls, foam toys, wakeboards, snowboards, bounce boards, hoops, nets, pylons, ropes, goals, harness systems, or inflated toys.

5. Quality, Manufacture, Construction and Installation

5.1 Quality, manufacture, construction and installation shall be in accordance with Practice [F1193-06](#).

5.1.1 All components shall be installed as per designer/engineer and manufacturer specifications.

5.1.2 The installer shall verify that all components and equipment are functioning to the designer/engineer and manufacturer specifications.

5.1.3 Self-locking nuts shall fully engage with the bolt.

5.1.4 Hardware in moving joints shall be secured against unintentional loosening.

5.1.5 There shall be no accessible sharp points or edges on fasteners.

5.1.6 There shall be no accessible burrs, sharp points, or sharp edges on device frames.

5.1.7 The trampoline court shall be designed, built and installed such that no part of the frame, legs or ground can be contacted by the TC bed while bouncing.

5.1.8 The designer/engineer, manufacturer, constructor or installer of the trampoline court shall provide to the owner/operator clear and concise inspection, maintenance, and repair instructions, including, but not limited to, what, when, and how to inspect, maintain, and repair.

6. General Design

6.1 Device Analysis:

6.1.1 The designer/engineer or manufacturer shall perform a device analysis or risk assessment that shall include the following:

6.1.2 The device analysis or risk assessment shall specifically include an assessment of the suitability of the design of the device for the intended patrons, including anthropomorphic factors that relate age and physical size.

6.1.3 The device analysis or risk assessment shall identify the most significant factors that may affect patron safety and shall include mitigation for each factor.

6.1.4 The device analysis or risk assessment shall be documented listing the safety issues that were identified and the means used to mitigate each issue.

6.2 Drawings and Records:

6.2.1 The designer/engineer or manufacturer shall produce and retain applicable as-built drawings, calculations, and control software that depict the trampoline court or major modification details. These drawings and calculations shall be retained for a minimum of 20 years from the date of last manufacture. In the case of a major modification, all records must be retained for a minimum of 20 years.

6.2.2 Documents deemed proprietary and confidential by the manufacturer shall include a statement of such on each document. Use of the manufacturer's documentation and records should be limited, where possible, to the installation, maintenance, inspection, operation and design review of the trampoline court. All other dissemination should be limited.

6.2.3 Documentation supplied to the buyer, owner, or operator shall be complete and adequate for proper installation, maintenance, inspection, and operation of the trampoline court or major modification.

6.2.4 Drawings and documents shall illustrate and define all important dimensions and tolerances. Dimensions, tolerances,