



Designation: F 2374 – 04

Standard Practice for Design, Manufacture, Operation, and Maintenance of Inflatable Amusement Devices¹

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1. Scope

1.1 This practice applies to the design, manufacture, and operation of inflatable amusement devices and their associated operating environments.

1.2 This practice specifically excludes inflatable devices that are used for professional exhibition or stunt work; safety and rescue activities; aerial or aviation structures or devices; exhibit floats; or similar inflatable devices.

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

2. Referenced Documents

2.1 ASTM Standards:²

F 698 Specification for Physical Information to be Provided for Amusement Rides and Devices

F 747 Terminology Relating to Amusement Rides and Devices

F 770 Practice for Operation Procedures for Amusement Rides and Devices

F 853 Practice for Maintenance Procedures for Amusement Rides and Devices

F 893 Guide for Inspection of Amusement Rides and Devices

F 1159 Practice for Design and Manufacture of Patron Directed, Artificial Climbing Walls, Dry Slide, Coin Operated and Purposeful Water Immersion Amusement Rides and Devices and Air-Supported Structures

F 1193 Practice for Amusement Ride and Device Manufacturer Quality Assurance Program and Manufacturing Requirements

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *inflatable amusement device, n*—an amusement ride or device, as defined by Terminology F 747, consisting of air-filled structures designed for use, as specified by the manufacturer, that may include but not be limited to bounce, climb, slide, or interactive play. They are made of flexible fabric, kept inflated by continuous air flow by one or more blowers, and rely upon air pressure to maintain their shape.

3.1.1.1 *Discussion*—This definition specifically excludes similar inflatable devices that are used for professional exhibition or stunt work, safety, and rescue activities, aerial or aviation structures or devices, exhibit floats, or similar inflatable devices.

3.1.2 *owner/operator, n*—the person or organization having overall control and responsibility for the maintenance, setup, and operation of the inflatable device.

3.1.3 *operator/attendant, n*—the person who has been properly trained and designated by the owner to direct the operation of the inflatable device.

3.1.4 *user, n*—a participant in the use of the inflatable device as defined by the manufacturer.

4. Significance and Use

4.1 The purpose of this practice is to delineate information regarding the design, manufacture, installation, operation, and maintenance of inflatable amusement devices.

5. Inflatable Amusement Device Design and Manufacture

5.1 Inflatable amusement device manufacturers shall identify the specified use of each inflatable device to the owner prior to or at the time of sale.

5.2 Inflatable amusement device manufacturers shall provide specifications, setup, maintenance, and repair instructions to the original purchaser in accordance with Specification F 698, Practice F 853, and Guide F 893 and shall include, but may not be limited to, the following topics:

5.2.1 Signage, setup, takedown, and storage specifications and procedures.

5.2.2 Inflation pressure(s).

¹ This practice is under the jurisdiction of ASTM Committee F24 on Amusement Rides and Devices and is the direct responsibility of Subcommittee F24.60 on Special Rides/Attractions.

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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.

5.2.3 Specifications for number of blowers and required rated capacity.

5.2.4 Requirements for environmental conditions that include, but are not limited to, location, surface material, and weather conditions.

5.2.5 Maximum capacity by weight or number of users.

5.2.6 Service and adjustment procedures for all components of the inflatable device.

5.2.7 Contact information to be used by the owner, operator, or attendant to secure maintenance or operating assistance from the manufacturer.

5.2.8 Daily, weekly, monthly or other periodic minimum service and component checklists.

5.2.9 User height, weight, age, and other physical requirements or restrictions.

5.2.10 The inappropriate attire worn by users.

5.2.11 The minimum number of operators and attendants for each inflatable amusement device to control ingress/egress and operations.

5.3 Inflatable devices shall be designed and manufactured in accordance with Practices F 1159 and F 1193, and shall include, but may not be limited to:

5.3.1 There shall be no sharp exterior or interior angles or edges, parts, or ancillary equipment accessible to users which will cause injury if contact is made with them.

5.3.2 There shall be no entrapment points.

5.3.3 The outside walls shall be designed to contain users when operated in accordance with manufacturer's specified use.

5.3.4 The design shall be sufficient to allow for evacuation in the event of deflation.

5.3.4.1 The design shall provide for when the inflation air supply is interrupted. Deflation shall be prevented or minimized by, but not limited to, the use of a non-return valve or flap fitted to the blower or inflatable device, and by placing the inflation tube to the lowest part of the structure.

5.4 Inflatable amusement devices shall be provided with an anchorage system to prevent unplanned displacement during operation.

5.4.1 The manufacturer shall specify the number and strength(s) of anchorage points, which adequately take into account calculations for likely or appropriate specified wind loading conditions or restrictions.

5.4.2 The manufacturer of inflatable amusement devices shall specify maximum wind speeds and the type of anchorage.

5.4.3 Anchoring systems for inflatable amusement devices shall be fixed stationary objects, installed or weighted in accordance with the manufacturers' recommendations.

5.4.4 Anchorage points installed near an entrance and exit of an inflatable amusement ride shall be connected in such a manner as to minimize the potential for tripping, abrasions, or other injuries.

5.5 Inflatable amusement devices shall be manufactured from flexible materials, which have tear and burst strength and sufficient air retention to perform according to ASTM specifications. The manufacturing criteria for inflatable amusement devices shall include, but may not be limited to the following:

5.5.1 Inflatable amusement devices shall be of a material that is flame-resistant in accordance with Practice F 1159 and meets local, state, or federal fire safety standards.

5.5.2 Where zips or zippers are used as emergency exits in inflatable amusement devices they shall be reliable, easy to use, and capable of being opened from both sides.

5.6 Blowers shall comply with Practice F 1159.

5.6.1 Blowers and inflation tubes shall be positioned so that they will not impede the ingress/egress of the device.

5.7 Inflatable amusement devices, which are designed and manufactured to be operated as totally enclosed structures without clear visibility of the surrounding exterior areas, shall provide exits that meet all local, state, or federal requirements as applicable to inflatable amusement devices or structures, or both.

6. Inflatable Amusement Device Operations

6.1 Inflatable amusement device owners and operators shall review the manufacturer's specifications, maintenance, and repair instructions in accordance with Specification F 698, Practice F 770, Practice F 853, and Guide F 893, and shall operate the inflatable device(s) in regard to the following topics which include, but may not be limited to:

6.1.1 Setup, takedown, and storage specifications and procedures.

6.1.2 Inflation pressure(s).

6.1.3 Specifications for number of blowers and required rated capacity.

6.1.4 Requirements for environmental conditions that include, but are not limited to, location, surface material, and weather conditions.

6.1.5 Maximum capacity by weight or number of users.

6.1.6 Service and adjustment procedures for all components of the inflatable device.

6.1.7 Daily, weekly, monthly, or other periodic minimum service and component checklists.

6.1.8 User height, weight, age, and other physical requirements or restrictions.

6.1.9 The inappropriate attire worn by users.

6.1.10 The minimum number of operator(s) and attendant(s) for each inflatable amusement device with controlled ingress/egress and use.

6.1.11 Inflatable amusement devices should not be used when the wind is in excess of the maximum wind speed specified by the manufacturer.

6.1.11.1 In the event that the manufacturer of the inflatable amusement device has not specified a maximum allowable wind speed for operations, the maximum wind speed for operations of inflatable amusement devices shall be 25 mph.

6.2 The operator of inflatable amusement devices shall operate the device away from hazards in accordance with Practice F 770.

6.3 The operator of an inflatable amusement device shall provide a protective ground cover for the inflatable device where appropriate in accordance with manufacturer's specifications.

6.3.1 The operator of an inflatable amusement device shall anchor and secure the device in accordance with the manufacturer's specifications and recommendations.