



Designation: F1159 – 15

Standard Practice for Design of Amusement Rides and Devices that are Outside the Purview of Other F24 Design Standards¹

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1. Scope

1.1 This practice establishes information and procedures for the design and manufacture of patron directed amusement rides or devices (for example, go karts, bumper cars, bumper boats), artificial climbing walls, dry slides, coin operated rides, and amusement rides and devices that involve the purposeful immersion of the patron's body partially or totally in the water and involve more than incidental patron contact (for example, pools, water slides, lazy rivers, interactive aquatic play devices), and air-supported structures.

1.2 *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

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

2.2 *Federal Document:*³

OSHA 29 CFR Fall Protection Systems Criteria and Practices Part 1926.502 (d)

3. Significance and Use

3.1 This practice provides designers/engineers of amusement rides and devices not addressed in the other ASTM

¹ This practice is under the jurisdiction of ASTM Committee F24 on Amusement Rides and Devices and is the direct responsibility of Subcommittee F24.24 on Design and Manufacture.

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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.

³ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Committee F24 standards with design references and criteria to use in design development.

4. General Design Requirements

4.1 *Design and Calculations*—Basic documentation and engineering analysis shall be in accordance with Practice F2291.

4.2 *Drawings and Records*—Records shall be kept in accordance with Practice F2291.

4.3 *Testing*—Document and record the testing performance of amusement rides and devices in accordance with the tests given in Practice F1193.

DESIGN PROCEDURES

5. Passenger Carrying Devices

5.1 *Design of Seats*—Design passenger seating to provide adequate support padding and containment for the passenger's body during operation, and to be consistent with the design intent of the ride.

5.2 *Methods of Restraint*—Where appropriate, base the passenger restraint on the design intent of the ride or device with consideration given, but not limited to, the height, speed, and forces on passengers.

5.3 *Passenger Clearance*—Design clearance to minimize the opportunity for contact between a contained passenger and any object where said contact is likely to cause injury during operation of a ride or device.

6. Amusement Ride and Device Structures Fastening, Mechanical Systems and Components, Fall Protection, Adhesive Bonding, and Coatings

6.1 Structures shall be designed in accordance with the provisions of Practice F2291, Section 8.

6.2 *Welding*—Welding and welding procedures shall be in accordance with the provisions of Practice F2291, Section 15.

6.3 *Fasteners*—Fasteners shall be designed in accordance with the provisions of Practice F2291, Section 16.

6.4 *Mechanical Systems and Components*—Mechanical systems and components shall be designed in accordance with the provisions of Practice F2291, Section 13.