Designation: F2783 – 20

Standard Practice for Design, Manufacture, Operation, Maintenance, and Inspection of Amusement Rides and Devices, in Canada[1]

This standard is issued under the fixed designation F2783; 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.

Note—This ASTM Standard has been developed to replace CAN/CSA Z267-00 (R2011), which is being withdrawn as an active CSA Standard.

INTRODUCTION

The Canadian Standards Association (CSA) and the American Society for Testing Materials (ASTM) have paved the way for the development of new ASTM amusement device standards, introducing uniform safety criteria for both Canada and the United States of America.

Seeking to gain a level of consistency and eliminate much duplication, CSA and ASTM struck a subcommittee to develop a new ASTM F24 standard, a comprehensive, one-volume document, that provides a mechanism to:

- adapt F24 standards to Canadian needs;
- provide greater two way communication between CSA and ASTM; and
- facilitate adoption by Canadian provinces and territories.

This one-source standard replaces the current CSA Z267 Safety Code for Amusement Rides and Devices. As CSA Z267 was primarily based on the ASTM F24 Family of Standards, Practice F2783 is a realignment of those core essentials with new sections tailor-made for Canada. Categorized in four distinct sections, the standard includes:

- **Core Standards** (for example, Terminology, Design, Manufacture, Operation, Maintenance, and Inspection);
- **Supporting Standards** (for example, Measuring Ride Dynamics and Hardness of Composite Foam);
- **Specific Classification of Amusement Rides and Devices Standards** (for example, Go-Karts, Water Slides, Inflatables and Trains); and
- **Other Standards** (other standards used to support amusement device design).

This standard is structured such that Section 2.2 listings of Core Standards capture the essential and broad safety requirements for all amusement rides and devices. Section 2.3 listings of Supporting Standards are intended to complement in design of all amusement rides and devices where applicable. Section 2.4 listings of Specific Classification of Amusement rides and Devices Standards capture supplemental requirements in addition to Core Standards for anomalous amusement rides and devices. Section 2.5 listing Other Standards used to support amusement device design.

To provide greater application within Canada, Practice F2783 also incorporates specific sections that include: Standards Cross Referencing Table; Substitutions; Exceptions; and Additional Requirements.

This unique initiative would not have been possible were it not for the active collaboration of the CSA Z267 and the ASTM F24.80 Harmonization Committees, representative of a diverse stakeholder base, including delegates from government (regulators), manufacturers, engineers, park owners/operators as well as general and consumer interests.

Practice F2783 is supported by Canadian provincial and territorial regulators and amusement device stakeholders, the International Association of Amusement Parks and Attractions (IAAPA), CSA and ASTM.

This standard has been printed in Canada's two official languages.

1. Scope

1.1 This practice applies to the terminology, design, manufacture, operation, maintenance, and inspection of amusement rides and devices in Canada.

1.2 This practice adopts ASTM Committee F24 Standards listed under subsections 2.2, 2.3 and 2.4. The adoption of the standards in 2.2, 2.3 and 2.4 in whole or part is at the sole discretion of the Authority Having Jurisdiction.

1.3 This practice includes an annex (mandatory), which provides additional information (for example, rationale, background, interpretations, drawings, commentary, etc.) related to the application of the criteria presented in this practice.

1.4 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.

1.5 It is the responsibility of the users of this practice and other ASTM Standards to judge their suitability for a particular purpose.

1.6 This practice includes the following sections:

1.7 For a glossary of terms that includes the meaning and intent of words such as shall, should, may, will, standard, practice, guide, classification, specification, etc. used in ASTM standards, please refer to "Form and Style for ASTM Standards," which is available at www.astm.org.

1.8 *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.*

1.9 *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 The documents listed in 2.2, 2.3 and 2.4 contain provisions, which through reference in this standard, constitute provisions of this practice.

NOTE 1—For undated references, the latest edition of the referenced document applies. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. Where a Ride Specific standard points to an earlier edition of a published Core standard, the requirements of the Ride Specific standard shall apply (unless specific direction has otherwise been provided by the authority having jurisdiction). However, users of this practice are encouraged to investigate the possibility of applying the most recent editions of documents referenced below.

2.2 *Core Standards for Amusement Rides and Devices:*[2]

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

F2974 Practice for Auditing Amusement Rides and Devices

2.3 *Supporting Standards for Amusement Rides and Devices:*[2]

F1957 Test Method for Composite Foam Hardness-Durometer Hardness

F2137 Practice for Measuring the Dynamic Characteristics of Amusement Rides and Devices

F2375 Practice for Design, Manufacture, Installation and Testing of Climbing Nets and Netting/Mesh used in Amusement Rides, Devices, Play Areas and Attractions

F3214 Practice for Characterization of Fire Properties of Materials Specified for Vehicles Associated with Amusement Rides and Devices

2.4 *Standards for Specific Classification of Amusement Rides and Devices:*[2]

F2007 Practice for Design, Manufacture, and Operation of Concession Go-Karts and Facilities

F2374 Practice for Design, Manufacture, Operation, and Maintenance of Inflatable Amusement Devices

F2376 Practice for Classification, Design, Manufacture, Construction, and Operation of Water Slide Systems

F2460 Practice for Special Requirements for Bumper Boats

F2461 Practice for Manufacture, Construction, Operation, and Maintenance of Aquatic Play Equipment

F2959 Practice for Aerial Adventure Courses

[1] This practice is under the jurisdiction of ASTM Committee F24 on Amusement Rides and Devices and is the direct responsibility of Subcommittee F24.80 on Harmonization.

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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.

F2960 Practice for Permanent Amusement Railway Ride Tracks and Related Devices
F2970 Practice for Design, Manufacture, Installation, Operation, Maintenance, Inspection and Major Modification of Trampoline Courts
F3054 Practice for Operations of Amusement Railway Rides, Devices, and Facilities
F3099 Practices for Parasailing
F3133 Practice for Classification, Design, Manufacture, Construction, Maintenance, and Operation of Stationary Wave Systems
F3158 Practice for Patron Transportation Conveyors Used with a Water Related Amusement Ride or Device

2.5 *Other Standards:*
D785 Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials
D2240 Test Method for Rubber Property—Durometer Hardness
F1159 Practice for Design of Amusement Rides and Devices that are Outside the Purview of Other F24 Design Standards

2.6 *Reference Codes, Standards, Specifications, and Handbooks:*

NOTE 2—Table 1 provides cross-references of document(s) acceptable in lieu of specific editions of codes, standards, specifications, and handbooks referenced in standards from ASTM Committee F24 on Amusement Rides and Devices. Only that portion of the codes, standards, specifications and handbooks as specified by the requirements of this standard is applicable.

3. Terminology

3.1 Terms that are meant to have common meaning among the ASTM Committee F24 standards referenced in Section 2 are defined in Terminology F747.

3.2 Terms that are meant to have specific meaning within the ASTM Committee F24 standards are defined in those standards referenced in Section 2.

3.3 *engineer, n*—an engineer as defined by and licensed in accordance with the applicable provincial or territorial statute.

3.4 *Clarification of Terminology in ASTM Committee F24 Standards:*

3.4.1 The term "attractions" used in the ASTM F24 Committee Standards for Amusement Rides and Devices hold the same meaning as "amusement rides or devices" defined in Terminology F747.

3.4.2 The term "English" used in the ASTM F24 Committee Standards for Amusement Rides and Devices means "English and French" for the purpose of this Standard.

4. Significance and Use

4.1 The purpose of this practice is to adopt the ASTM F24 Committee Standards for Amusement Rides and Devices for use in Canada.

4.2 This practice provides guidance for use of additional codes and standards in Canada.

4.3 In cases where conflicts exist between this practice and local codes, local codes would prevail.

5. Design

5.1 *General*—Amusement rides and devices shall be designed in accordance with Practice F2291.

5.1.1 The significance and use of Practice F2291 are explained in Appendix X1.1.

5.2 *Substitution of Referenced Documents in Practice F2291 with Alternate Documents:*

5.2.1 *General:*

5.2.1.1 Subsection 2.6 lists substitution of referenced documents in Practice F2291 with acceptable alternate documents for their applicability in Canada.

5.2.1.2 Amusement rides and devices shall meet the requirements specified in Sections 5.2.2 and 5.2.3.

5.2.2 *Canadian Standards:*

5.2.2.1 All electrical apparatus and wiring in amusement rides and devices shall conform to the requirements CSA C22.1.

5.2.2.2 All references to NFPA 70 (the National Electrical Code) in Practice F2291 shall have substituted the applicable rules of CSA C22.1, Canadian Electrical Code.

5.2.2.3 Where electrical equipment used in an amusement ride or device is not certified or listed, and marked or labeled to the pertinent standard in Part II of the Canadian Electrical Code, it shall be field evaluated and labeled or marked to the requirements of CSA SPE-1000, Model Code for the Field Evaluation of Electrical Equipment.

NOTE 3—Carnival and traveling show owners or operators, where required by the local jurisdiction, should arrange to have installation and connection of electrical equipment on amusement rides or devices inspected at every event to ensure they meet the safety standards defined in the adopted Electrical Safety Code. Annex A1 provides a listing of certification agencies acceptable by authorities having jurisdiction.

5.2.2.4 *Overhead Utilities*—Amusement rides or devices shall not be located in proximity to overhead electric supply and communication utility systems unless the overhead system meets the requirements of CAN/CSA-C22.3 No. 1.

NOTE 4—Proximity as defined in CAN/CSA-C22.3 No. 1 means that lines are so located that the failure of a conductor or any part of the overhead system (such as overturning at the ground line) would interfere with the normal use, operation, or maintenance of an amusement ride or device by contact or encroachment on minimum clearance requirements by the conductor or structure.

5.2.2.5 *Clearances to Structures*—Clearances between an amusement ride or device and structures not forming part of the amusement device shall meet the requirements of the National Fire Code of Canada (NFCC).

5.2.2.6 *Fixed Amusement Rides or Devices Foundation*—Foundations for fixed amusement rides or devices shall be designed in accordance with the National Building Code of Canada (NBCC).

5.2.2.7 *Amusement Rides or Devices Structure*—Wind, snow, ice, and earthquake loads on amusement rides or devices structure shall be calculated in accordance with requirements specified in the NBCC.

5.2.3 *Specific References within Canadian Standards:*

5.2.3.1 With respect to electrical grounding, reference to NFPA 70, Section 525-Ca in Practice F2291 may be understood to refer to CSA C22.1, Section 66.