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Safety of amusement rides and amusement devices —

Part 2: Operation and use

Sécurité des manèges et des dispositifs de divertissement —

Partie 2: Fonctionnement et utilisation

Reference number
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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 254, *Safety of amusement rides and amusement devices.*

This second edition cancels and replaces the first edition (ISO 17842-2:2015), which has been technically revised.

The main changes are as follows:

— references to ISO/TS 17929 have been removed;

— the list of terms in Clause 3 has been updated;

— 4.2, Standard documentation has been updated;

— 4.3.3.3.1, General has been added;

— 4.3.4.1, General has been added;

— 4.3.4.4.3, Operating control equipment has been updated;

— 4.3.4.4.4, Control equipment operated by passengers has been updated;

— 4.3.5.2, Daily check and trial run has been updated;

— 4.3.6.1, During operating cycle has been updated;

— 4.3.8.3, Repairs has been updated;

— 4.3.8.4, Modification has been updated;

— 4.6.1.2, Inspection process and 4.6.2, Reports have been added;

— Table A.1 was updated;

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— Annex B has been added;

— Bibliography was updated.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Safety of amusement rides and amusement devices —

Part 2: Operation and use

1 Scope

This document specifies the minimum requirements necessary to ensure the safe maintenance, operation, inspection and testing of amusement rides and amusement devices which are intended to be installed both repeatedly without degradation or loss of integrity, and temporarily or permanently in fairgrounds and amusement parks or any other locations, and is concerned with the installing, assembly and disassembly, operating, handling, maintaining, repairing, modifying and inspecting of amusement devices, and is addressed to controllers, operators, attendants and inspection bodies.

The following are not covered by this document (this list is not exhaustive):

— grandstands;

— construction site installations;

— scaffolding;

— removable agricultural structures;

— simple coin-operated children's amusement devices;

— carrying up to three children, and recreational devices like waterslides or summer toboggan runs;

— playground equipment;

— rope courses;

— climbing walls;

— inflatable trampolines and swimming pool equipment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2307, *Fibre ropes — Determination of certain physical and mechanical properties*

ISO 9554, *Fibre ropes — General specifications*

ISO 7165, *Fire fighting — Portable fire extinguishers — Performance and construction*

ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO/IEC 17020, *Conformity assessment — Requirements for the operation of various types of bodies performing inspection*

ISO 17842-1, *Safety of amusement rides and amusement devices — Design and manufacture*

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ISO 17842-3, *Safety of amusement rides and amusement devices — Requirements for inspection during design, manufacture, operation and use*

IEC 60947-3, *Low-voltage switchgear and controlgear — Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*

EN 12385, *Steel wire ropes — Safety*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 17020, ISO 17842-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
amusement device
arrangement of equipment that produces the desired effect of amusement or entertainment when the passenger moves through it or on it primarily by his or her own action, or any other system that is not covered by the term *amusement ride* (3.3)

3.2
amusement device log
book and/or electronic data file containing all the necessary information about the use and history of any *amusement device* (3.1)

3.3
amusement ride
device to entertain *passengers* (3.21) during motion, creating biomechanical effects on passengers

Note 1 to entry: In this document, the term "amusement device" is used to refer to an *amusement device* (3.1) or amusement ride.

3.4
attendant
trained person appointed to work under the supervision of an *operator* (3.20), to assist in the operation of an *amusement device* (3.1) available for use by the public.

3.5
barrier
device intended to prevent the user from falling and from passing beneath

3.6
competent person
person who can demonstrate that they have acquired through training, qualifications or experience, or a combination of these, the knowledge and skills enabling them to perform a specified task

3.7
component
component which forms part of an assembly in which at least one component moves

Note 1 to entry: Excluding vibration and deformation.

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3.8
controller
ride controller
person or organisation having overall control of an *amusement device* (3.1).

Note 1 to entry: This can be either an individual or corporate body owning an *amusement device* (3.1) or the concessionaire or lessee who has been granted control of the amusement device, by the owner, for a specified period.

3.9
designer
engineer
person or body responsible for the design of a device (or modifications thereof)

Note 1 to entry: The duties of designer include, but are not limited to, establishing and describing the configuration of the amusement ride or device, conducting appropriate risk assessment(s), establishing strength (including fatigue strength), designing and specifying electrical/electronic control systems, defining the acceptable quality level for production, defining inspection criteria and including the provision of the necessary documentation

3.10
design review
document detailing the review of all the applicable design documents, to determine the suitability for use of a device

3.11
design risk assessment
DRA
document produced by the *designer* (3.9) as a tool for a safe design within the agreed scope of supply

3.12
fence
structure designed to restrict or prevent movement across a boundary without changing elevation

3.13
gate
section of *fence* (3.12) or *barrier* (3.5) that can be opened to provide access or egress

3.14
guest
person who interacts with an amusement device

3.15
initial approval
design and calculation review, verification, examinations and tests executed by the inspecting body before a device is first made available for public use

3.16
inspection body
organization capable of carrying out examination, tests and approval of amusement devices

3.17
manufacturer
individual or commercial entity who is responsible for manufacturing a product with the view to placing it on the market under their own name

Note 1 to entry: Any commercial operator that either places a product on the market under their own name or trademark or modifies a product in such a way that compliance with applicable requirements can be affected should be considered the manufacturer and should assume the obligations of the manufacturer.

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3.18
modification
safety-related alteration to the hardware or software of a device, including the introduction of a new safety-related component or the substitution of a safety-related component, which results in a deviation from the design specification

3.19
operation and use risk assessment
OURA
document, produced by the controller, that details all of the considered risks inherent during all modes of amusement device operation and the means taken to mitigate against them

Note 1 to entry: See 5.1.2.2.

3.20
operator
trained person appointed by the *controller* (3.8) to be in charge of the operation of an amusement device when it is available for the public

3.21
passenger
patron
person using an amusement device

3.22
passenger containment
components (e.g. seating, foot wells, handrails, passenger restraints) designed to prevent passengers from moving outside a predetermined area on a ride either as a result of biomechanical effects, the ride forces or the reasonably foreseeable behaviour of the passenger

3.23
passenger unit
PU
part or parts of an amusement ride in or on which the *passengers* (3.21) are intended to ride

3.24
permit
authorization to operate an amusement device in a particular member state granted by the legally authorised body after successful approval and/or examination

3.25
platform
horizontal or inclined surface raised above the level of an adjacent area

Note 1 to entry: See ISO 17842-1:2015, 5.1.3.2 for maximum slope of platform.

3.26
repair
restoration of components or assemblies to a technically acceptable condition

Note 1 to entry: See also ISO 17842-3:2019, 4.3.8.3.

3.27
restraint
system, device, or characteristic that is intended to inhibit or restrict the body movement and/or keep the body position to tolerate accelerations of the passenger(s) while on the amusement ride or amusement device

Note 1 to entry: Position in which the restraint is intended to remain during the operation of the device in order to restrain the *passenger* (3.21) is called closed restraint.

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3.28
safety envelope
theoretical or actual physical space that can be encroached upon by any part of a *passenger* (3.22) of an amusement ride during the ride cycle

3.29
safety-related component
component of an *amusement device* (3.1) on which the safety of the *passengers* (3.21) is dependent as identified in the *design risk assessment* (3.11) and/or the *operation and use risk assessment* (3.19)

3.30
service
replacement or replenishment and check of conditions of components, including fluids which are designated to be replaced or replenished or checked at specified intervals

3.31
spectator
person in the vicinity of an amusement device

Note 1 to entry: Typically defined as a person watching the operation of the amusement device or waiting to gain access to the use the amusement device.

3.32
thorough examination
procedures and investigations necessary for the *inspection body* (3.16) to decide whether the *amusement device* (3.1) can continue to be operated safely, or whether it requires defects to be remedied immediately or within a specified time

3.33
trial run
proving run of *an amusement device* (3.1) during which no *passengers* (3.21) are carried

4 Operation, maintenance and use of amusement rides and amusement devices

4.1 General

This document is concerned with the installing, assembly and disassembly, operating, handling, maintaining, repairing, modifying and inspecting of amusement devices, and is addressed to controllers, operators, attendants and inspection bodies.

Recommendations for training, qualification and experience for competent people performing the design, maintenance, repair and testing of amusement rides are given in Annex A.

Information on the provisions that are recommended prior to use of attractions and recommendations on procedures to be followed are given in Annex B.

4.2 Standard documentation

The following documents shall be prepared for all amusement devices:

— operating manual (see ISO 17842-1:2015, 5.5.1.3) to include at least the following:
  — maintenance instructions;
  — NDT schedule;
  — operating instruction;
  — inspection instruction;

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