



SLOVENSKI STANDARD
SIST EN 13814-1:2019/oprA1:2023
01-december-2023

Varnost naprav in opreme v zabaviških parkih - 1. del: Načrtovanje in izdelava

Safety of amusement rides and amusement devices - Part 1: Design and manufacture

Sicherheit von Fahrgeschäften und Vergnügungseinrichtungen - Teil 1: Konstruktion, Bemessung und Herstellung

Sécurité des manèges et des dispositifs de divertissement - Partie 1 : Conception et fabrication

Ta slovenski standard je istoveten z: EN 13814-1:2019/prA1

[SIST EN 13814-1:2019/oprA1:2023](https://standards.iteh.ai/catalog/standards/sist/8c02d238-8bff-4318-b15f-97f971826d47/sist-en-13814-1-2019-opra1-2023)

ICS:

97.200.40

Igrišča

Playgrounds

SIST EN 13814-1:2019/oprA1:2023

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EUROPEAN STANDARD
NORME EUROPÉENNE
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English Version

Safety of amusement rides and amusement devices - Part 1: Design and manufacture

Sécurité des manèges et des dispositifs de
divertissement - Partie 1 : Conception et fabrication

Sicherheit von Fahrgeschäften und
Vergnügungseinrichtungen - Teil 1: Konstruktion,
Bemessung und Herstellung

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 152.

This draft amendment A1, if approved, will modify the European Standard EN 13814-1:2019. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

This draft amendment was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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EN 13814-1:2019/prA1:2023 (E)**European foreword**

This document (EN 13814-1:2019/prA1:2023) has been prepared by Technical Committee CEN/TC 152 “Fairground and amusement park machinery and structures - Safety”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

EN 13814 consists of the following parts, under the general title “*Safety of amusement rides and amusement devices*”:

- *Part 1: Design and manufacture*
- *Part 2: Operation, maintenance and use*
- *Part 3: Requirements for inspection during design, manufacture, operation and use*

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1 Modification to 4.1.5, "Principles of analysis"

Replace the 5th paragraph, 3rd bullet

"stability limit states analysis: i.e. bar buckling, plate and shell buckling;"

with

"stability limit states analysis: i.e. bar buckling, plate, shell and torsional buckling;"

2 Modification to 4.2.7, "Fasteners for structural components"

Replace the 3rd sentence of the subclause

"For machinery and mechanisms other bolts according to appropriate standards may be used."

with

"For machinery and mechanisms calculated bolts according to 4.7.4 may be used."

3 Modification to 4.3.3.1.2.1, "Passenger carrying units (vehicles, cars, gondolas)"

Replace the sentence below Note 2

"The designer should consider possible higher weight depending on the seat configuration, type of ride and anthropometric data."

with

"The designer may need to consider possible higher weight depending on the seat configuration, unbalanced load-situation, type of ride and anthropometric data."

4 Modifications to 4.3.3.1.2.2, "Other vertical loads"

Below "Universal, public access:" delete the following paragraphs:

" $Q_k = 5,0 \text{ kN} / \text{m}^2$ for grandstands and their stairways and landings with fixed seats; and as a superior value, if particularly dense crowds are anticipated for the above-mentioned categories;

$Q_k = 7,5 \text{ kN} / \text{m}^2$ for grandstands and their stairways and landings without seats or non-fixed seats; and as a superior value, if particularly dense crowds are anticipated for the above-mentioned categories;"

Below "Universal, public access:" replace in the last paragraph

" $Q_k = 1,5 \text{ kN} / \text{m}^2$ "

with

" $Q_k = 1,5 \text{ kN} / \text{m}$ ".

5 Modification to 4.3.3.1.2.3, "Horizontal imposed loads"

Change the number of the subclause from "4.3.3.1.2.3" to "4.3.3.1.3".

EN 13814-1:2019/prA1:2023 (E)**6 Modification to 4.4.2.1, "Conditions for calculating rotating type amusement devices"**

Replace the first paragraph

"Amusement devices shall be calculated in operative, inoperative, fully loaded, partially loaded and unbalanced conditions. One-sided loading shall be assumed as meaning that at only those seats which are situated on 1/4 or 3/4 of the perimeter are occupied. The verification of the ultimate limit state shall be carried out for these one-sided loading conditions."

with

"Amusement devices shall be calculated in operative, inoperative, fully loaded, partially loaded and unbalanced conditions. One-sided loading shall be assumed as meaning that at only those seats which are situated on 1/4 or 3/4 of the perimeter are occupied. The corresponding sector portions shall be selected for the most unfavourable case, and the seats situated at the edge of the sector concerned shall be included in the count. The verification of the ultimate limit state shall be carried out for these one-sided loading conditions."

7 Modifications to 4.7.2, "Predominantly static stress"

Replace the 1st sentence

"Characteristic stresses of materials used for structural components shall be taken from 4.2."

with

"Characteristic stresses of materials used for components shall be taken from 4.2."

Replace the 2nd sentence

"With regard to general stress analysis of machinery components made of steel, including components which act simultaneously as structural components, the following relationships shall apply:"

with

"With regard to general stress analysis of components made of steel, including components acting as structural components, the following relationships shall apply:"

8 Modifications to 4.7.4, "Bolts"

Replace the title of Table 6

"Pre-stressing forces and tightening torques for bolts EN 14399-4/EN 14399-6/EN ISO 4014/EN ISO 4017"

with

"Pre-stressing forces and tightening torques for bolts EN 14399-4/EN 14399-6/EN ISO 4014/EN ISO 4017/EN ISO 4032".

In Table 6, in the 3rd column, replace

"Bolting assemblies according to EN 14399-4/EN 14399-6"

with

"Bolting assemblies according to EN 14399-4 and EN 14399-6 and EN ISO 4032".

In Table 6, in the 4th column, replace

"Bolts according to EN ISO 4014/EN ISO 4017"

with

"Bolts according to EN ISO 4014 and EN ISO 4017".

9 Modification to 4.7.5.1.2, "Ropes and chains under fluctuating loads (suspension of passenger carrying devices e.g. chairs, gondolas)"

Replace the 3rd paragraph

"The use of ropes, chains, belts or straps made of hemp, plastics or leather is not permitted for these applications."

with

"The use of materials other than steel requires special investigations to enable use."

10 Modifications to 5.1.4.1.1, "General"

Replace the 1st paragraph

"Barriers, guardrails or other suitable means shall be provided where a person might fall 0,40 m or more due to a difference in the height of adjacent levels. Where there is a difference in levels from 0,40 m up to 0,60 m the risk assessment should determine if any area separation system is required."

with

"Barriers, guardrails or other suitable means as mentioned under J3 (5.1.4.2.3) shall be provided where a person could fall 0,40 m or more due to a difference in the height of adjacent levels. Where there is a difference in levels from 0,40 m up to 0,60 m the risk assessment could determine the need for other suitable risk mitigation.

NOTE Other suitable means may include flexible devices, markings, the type of impact surface, free fall space, avoidance of hazardous parts on the impact surfaces, avoidance of potential crowding, etc. EN 1176-1 and EN 1177 provide useful information on fall protection.

Hazards related to crushing, impact or entanglement should be assessed independently according to 5.1.4."

Replace the 5th paragraph, 2nd sentence

"In this case chains and ropes for the top and intermediate rails are also permitted, if they withstand the forces defined in 4.3.3.1.2.3 with a maximum deflection of 30 mm."

with

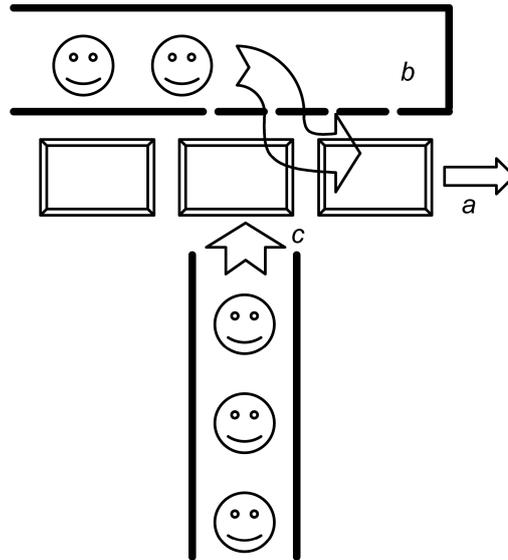
"In this case chains and ropes for the top and intermediate rails are also permitted, if they withstand the forces defined in 4.3.3.1.3 with a maximum deflection of 30 mm."

11 Modification to 5.1.6.1.1, "General"

Replace Figure 15 "Examples of parallel and perpendicular access to a vehicle in motion" with the following:

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“



”.

12 Modifications to 5.1.7.1.3, "Minimum dimensions of Safety Envelope"

In Table 11 "Lateral minimum safety distances", replace rows C and D with the following:

”

C	$10 \frac{m}{s} < v \leq 20 \frac{m}{s}$	1 000 mm (900 mm for children up to the age of 10 years)	900 mm	500 mm
D	$v > 20 \frac{m}{s}$	1 000 mm (900 mm for children up to the age of 10 years)	1 000 mm (900 mm for children up to the age of 10 years)	700 mm

”.

Replace Figure 16 "Vertical safety distance from the floor and lateral safety distance for passengers" with the following: