



SLOVENSKI STANDARD

SIST EN 13814-3:2019

01-september-2019

Nadomešča:

SIST EN 13814:2005

Varnost naprav in opreme v zabaviških parkih - 3. del: Zahteve za nadzor med načrtovanjem, izdelavo, delovanjem in uporabo

Safety of amusement rides and amusement devices - Part 3: Requirements for inspection during design, manufacture, operation and use

Sicherheit von Fahrgeschäften und Vergnügungseinrichtungen - Teil 3: Anforderungen an die Überprüfung während der Konstruktion, Bemessung, Herstellung, Betrieb und Gebrauch

Sécurité des manèges et des dispositifs de divertissement - Partie 3: Exigences relatives à l'inspection pendant la conception, la fabrication et le fonctionnement

Ta slovenski standard je istoveten z: EN 13814-3:2019

ICS:

97.200.40 Igrišča Playgrounds

SIST EN 13814-3:2019 en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 13814-3:2019

<https://standards.iteh.ai/catalog/standards/sist/4b82adb1-987c-483e-96dc-c9d73a01456f/sist-en-13814-3-2019>

EUROPEAN STANDARD

EN 13814-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2019

ICS 97.200.40

Supersedes EN 13814:2004

English Version

Safety of amusement rides and amusement devices - Part 3: Requirements for inspection during design, manufacture, operation and use

Sécurité des manèges et des dispositifs de
divertissement - Partie 3: Exigences relatives à
l'inspection pendant la conception, fabrication et
fonctionnement

Sicherheit von Fahrgeschäften und
Vergnügungseinrichtungen - Teil 3: Anforderungen für
die Inspektion während der Konstruktion, Herstellung,
Betrieb und Nutzung

This European Standard was approved by CEN on 13 May 2018.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

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

Contents	Page
European foreword.....	3
1 Scope.....	4
2 Normative references.....	4
3 Terms and definition	4
4 Requirements	4
4.1 Initial approval - Procedures.....	4
4.1.1 General.....	4
4.1.2 Review of design documents.....	5
4.1.3 Inspection of manufacturing process	5
4.2 Pre-use inspection and review – Procedures.....	7
4.3 In-service inspection (periodical test)	7
4.3.1 General.....	7
4.3.2 Inspection process.....	7
4.3.3 Electrical equipment.....	9
Bibliography.....	10

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 13814-3:2019](https://standards.iteh.ai/catalog/standards/sist/4b82adb1-987c-483e-96dc-c9d73a01456f/sist-en-13814-3-2019)

<https://standards.iteh.ai/catalog/standards/sist/4b82adb1-987c-483e-96dc-c9d73a01456f/sist-en-13814-3-2019>

European foreword

This document (EN 13814-3:2019) 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 European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2019, and conflicting national standards shall be withdrawn at the latest by May 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document, together with its first and second parts, supersedes EN 13814:2004.

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*

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 13814-3:2019 (E)**1 Scope**

This part of EN 13814 defines requirements for the necessary independent inspections of amusement devices designed, manufactured, operated and used according to EN 13814-1:2019 and EN 13814-2:2019.

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.

EN 13814-1:2019, *Safety of amusement rides and amusement devices — Part 1: Design and manufacture*

EN 13814-2:2019, *Safety of amusement rides and amusement devices — Part 2: Operation, maintenance and use*

EN 60204-1, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements*

EN ISO 9712, *Non-destructive testing - Qualification and certification of NDT personnel (ISO 9712:2012)*

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

3 Terms and definition

ITeH STANDARD PREVIEW
(standards.iteh.ai)

For the purposes of this document, the terms and definitions given in EN 13814-1:2019 and EN 13814-2:2019 apply.

SIST EN 13814-3:2019

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Requirements**4.1 Initial approval - Procedures****4.1.1 General**

The initial approval of any amusement device consists of review, inspections and tests to be carried out as follows.

The inspection body performing the initial approval shall operate in accordance with EN ISO/IEC 17020.

All safety-relevant design documents as well as the completed amusement device shall be subjected to review and inspection. After a successful inspection, a document confirming compliance with EN 13814-1:2019 and EN 13814-3:2019 may be issued.

The results of the various reviews, inspections and tests shall become an integral part of the amusement device log.

The initial approval of the amusement device shall comprise:

- a) design review;

- b) inspection of manufacturing process; and
- c) initial inspection and testing.

4.1.2 Review of design documents

The review of design documents is an inspection of relevant design documents.

The design documents shall be, where relevant, reviewed, checked and accepted by an independent body for:

- completeness;
- correctness of all the assumptions with respect to the input values for any analyses;
- correctness of all calculations;
- compliance with applicable standards and specifications.

The design documents shall include where relevant:

- design risk assessment;
- design calculations;
- stress and fatigue analysis; **STANDARD PREVIEW**
- stability verification; **(standards.iteh.ai)**
- structural and mechanical parts; [SIST EN 13814-3:2019](https://standards.iteh.ai/catalog/standards/sist/4b82adb1-987c-483e-96dc-d73a01456f/sist-en-13814-3-2019)
- hydraulic and pneumatic parts; <https://standards.iteh.ai/catalog/standards/sist/4b82adb1-987c-483e-96dc-d73a01456f/sist-en-13814-3-2019>
- drive units, bearings;
- brakes and safety devices;
- design drawings;
- acceleration/ containment details;
- hydraulic/ pneumatic specification;
- electrical/ electronic specification including software details;
- mechanical /structural specification;
- installation, operation, maintenance and inspection information.

See EN 13814-1:2019, 4.4.1 for the principles of structural analysis.

4.1.3 Inspection of manufacturing process

4.1.3.1 Description

The inspection of the hereafter stated manufacturing requirements shall be made, when appropriate, during the manufacturing process and completed before operation with passengers. As a general

EN 13814-3:2019 (E)

requirement, the compliance of the parts, assemblies, components as well as their assembly and combined effects within the entire installation shall be confirmed with respect to the approved design documents.

This shall be covered by a report which confirms correctness and suitability of the employed materials and correctness of assembly.

The report may make reference to the manufacturer's inspection documents quality system and/or declarations as part of the proof of conformity.

4.1.3.2 Inspection requirements

Inspection shall, as a minimum, verify the following:

- a) conformity of the main dimensions, clearance distances and dimensions, free (easy) running of moving parts;
- b) existence of all constructional components indicated in the construction documents;
- c) compliance with the major dimensions of the load-carrying constructional components and their connections. Inaccessible constructional components or component groups are only to be dismantled when there are doubts concerning the compliance of the dimensions or the correct assembly/mounting;
- d) compliance with the weight on which the calculations are based for such parts whose excess weight would cause the permissible stress on connections or constructional components to be exceeded, or whose shortage in weight might affect the safety of the equipment as far as lifting-off, sliding or tilting-over are concerned;
- e) conformity of the required certificates concerning material specification and quality, e.g. strength, durability, fire resistance;
- f) conformity of the electrical, electronic, hydraulic/pneumatic equipment with wiring, circuit diagrams, including when possible software, observance of the relevant EN and/or IEC standards and the applicable regulations and standards;
- g) compliance with welding procedures specifications, shaping, machining, thermal treatment, coating of the structural and safety related parts by NDT.

The inspection of bearings, motors, enclosed drive units, switch and control units and similar components is required for, and limited to, only such cases where their failure could affect the safety of persons.

4.1.3.3 Initial inspection and testing

The initial inspection and testing shall consist of a number of separate inspections and tests which, taken together, demonstrate that at the time and place of the testing and inspection the amusement device is capable of performing in accordance with the approved design documents. Functional tests concerning the movements unloaded and under full load are required. Unbalanced load tests are to be made in accordance with EN 13814-1:2019, 4.4.2.1. See EN 13814-1:2019, 4.3.3.1.2.1 for test loads. During the trial run, the following functions and conditions shall be checked, as applicable:

- safety envelope for passengers relative to any moving parts or other objects;
- correct working of sequential, forced and interlocked control systems;
- the specified speeds, accelerations and safety critical weights e.g. ballast, counterweights;

- the working pressures of hydraulic/ pneumatic systems;
- the correct connection of electric supply;
- the setting of inclination control switches, terminal switches and other control switches as well as overload protections (e.g. pressure relief valves);
- the safety devices (e.g. anti-roll back devices for vehicles and on the track);
- the brakes as to their efficiency and the acceptable deceleration as far as passengers are concerned;
- the operational performances as far as lifting-off or tilting is concerned;
- the operation of the ride and the accelerations and decelerations under normal working conditions and in cases of emergency.

4.2 Pre-use inspection and review – Procedures

Initial approvals, inspections and tests shall be carried out, by applying the following procedures:

The inspection body shall be in accordance with EN ISO/IEC 17020.

All safety relevant design documents as well as the completed amusement device shall be subjected to review and inspection. After a successful inspection, a document confirming compliance with EN 13814-1:2019 and EN 13814-3:2019 can be issued.

The results of the various inspections and reviews shall become an integral part of the amusement device log.

The initial approval of amusement devices shall comprise:

- design review; <https://standards.iteh.ai/catalog/standards/sist/4b82adb1-987c-483e-96dc-c9d73a01456f/sist-en-13814-3-2019>
- inspection of manufacturing process;
- initial inspection and testing.

4.3 In-service inspection (periodical test)

4.3.1 General

The purpose of in service inspection is for an inspection body to check on the fitness of an amusement device for continued further use during its operational life. It is a check on the safety-related components of an amusement device to ensure that they have not deteriorated to such an extent that the ride cannot continue to operate safely. The findings of the inspection and the requirements shall be recorded in a report along with the interval to the next inspection.

In-service inspection does not remove the duty on the controller of an amusement device to ensure that the amusement device is adequately maintained, nor does it duplicate the initial approval procedure.

Where there are no national regulations stating otherwise, an annual independent inspection shall be carried out (see EN 13814-2:2019, Annex B for examples of regulation).

More frequent inspections may be agreed between the controller and the manufacturer and/or the inspection body or other relevant authorities to ensure the integrity of the device.

4.3.2 Inspection process

All amusement devices require a visual inspection as part of the in service inspection.