



BSI Standards Publication

Safety of amusement rides and amusement devices

Part 1: Design and manufacture

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National foreword

This British Standard is the UK implementation of EN 13814-1:2019. Together with BS EN 13814-2:2019 and BS EN 13814-3:2019, it supersedes BS EN 13814:2004, which will be withdrawn upon publication of the rest of the series.

The UK participation in its preparation was entrusted to Technical Committee MCE/3/4, Fairground and amusement park machinery and structures - Safety.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 580 91340 2

ICS 91.040.99

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2019.

Amendments/corrigenda issued since publication

Date	Text affected
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EUROPÄISCHE NORM

May 2019

ICS 97.200.40

Supersedes EN 13814:2004

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 European Standard was approved by CEN on 13 May 2018.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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Contents	Page
European foreword	6
Introduction	7
1 Scope.....	8
2 Normative references.....	8
3 Terms and definitions.....	11
4 Requirements for design analysis	16
4.1 Design documents.....	16
4.1.1 General.....	16
4.1.2 Design risk assessment.....	16
4.1.3 Description of design and operation	16
4.1.4 Design and manufacturing drawings.....	16
4.1.5 Principles of analysis.....	17
4.2 Selection of materials.....	18
4.2.1 General.....	18
4.2.2 Recommended steels.....	18
4.2.3 Aluminium alloy	19
4.2.4 Timber	19
4.2.5 Plastic composites	19
4.2.6 Concrete	19
4.2.7 Fasteners for structural components.....	19
4.2.8 Standards relating to ropes, chains, safety devices, connectors and adapters	19
4.3 Design loads.....	20
4.3.1 General.....	20
4.3.2 Permanent actions	21
4.3.3 Variable actions.....	21
4.3.4 Seismic forces.....	25
4.3.5 Applicable coefficients.....	26
4.3.6 Load combination	27
4.4 Structural analysis - Principles.....	28
4.4.1 General.....	28
4.4.2 Analysis principles for various types of rides	29
4.4.3 Other railways with track-bound vehicles	33
4.5 Verification of stability	34
4.5.1 Safety against overturning, sliding and lifting	34
4.6 Ground anchorage	36
4.6.1 General.....	36
4.6.2 Design load bearing capacity of weight anchors	37
4.6.3 Design load bearing capacity of rod anchors.....	37
4.6.4 Testing of anchors (Numbering)	39
4.6.5 Calculation of loads on anchors.....	39
4.6.6 Further requirements	40
4.6.7 Ground support for packing.....	41
4.7 Verification of strength.....	41
4.7.1 General.....	41
4.7.2 Predominantly static stress	42
4.7.3 Fluctuating stress.....	42
4.7.4 Bolts.....	45

This is a preview of "BS EN 13814-1:2019". [Click here to purchase the full version from the ANSI store.](#)

4.7.5	Ropes, chains, safety devices, connectors and adapters	47
4.8	Structural design and construction	49
4.8.1	Arrangement, accessibility.....	49
4.8.2	Locking and safety devices for fasteners	49
4.8.3	Joints intended for regular dismantling.....	49
4.8.4	Designing of components subject to fluctuating loads.....	50
4.8.5	Supports.....	50
4.8.6	Central masts.....	50
4.8.7	Prevention of corrosion and rot.....	50
5	Requirements for design and manufacture of rides and structures.....	50
5.1	Risk reduction by prevailing design and safety measures	50
5.1.1	General	50
5.1.2	Risk assessment	51
5.1.3	Risk reduction for platforms, ramps, floors, stairs and walkways.....	52
5.1.4	Risk reduction by the use of barriers, fencing and guarding.....	56
5.1.5	Guarding of machinery parts.....	60
5.1.6	Risk reduction in the case of access and egress	60
5.1.7	Risk reduction for passengers units	62
5.1.8	Requirements by special provisions	74
5.2	Supplementary safety requirements for various types of amusement device.....	75
5.2.1	Amusement rides with vertical axis	75
5.2.2	Amusement rides with horizontal axis.....	77
5.2.3	Rail-guided channel or track-bound amusement devices	79
5.2.4	Dodgem cars/Bumper cars	81
5.2.5	Speedways/Go-karts	86
5.2.6	Mini-motorbikes for children	86
5.2.7	Boat rides.....	87
5.2.8	Flume rides	88
5.2.9	Helter skelters, slides, etc.....	89
5.2.10	Side shows, booths, win-a-prize and sales stands, mazes, halls of mirrors, fun houses, labyrinths, hammers, ring the bell and similar	90
5.2.11	Shooting stands and trailers, shooting devices	92
5.3	Mechanical systems	94
5.3.1	Hydraulic and pneumatic devices	94
5.3.2	Lifting and elevating units being integral part of a ride.....	96
5.4	Manufacture and supply	99
5.4.1	Manufacturer	99
5.4.2	Quality assurance — Quality plan	100
5.4.3	Manufacturing process.....	101
5.4.4	Safety precautions to be taken by the manufacturer	103
5.4.5	Electrical installations	103
5.5	Supply	103
5.5.1	Manuals	103
5.5.2	Special information.....	105
5.5.3	Drawings and diagrams.....	105
5.6	Design documentation.....	105
5.6.1	General	105
5.6.2	Description of installation and technical specification/information.....	106
5.7	Amusement Device Log	106
5.7.1	General	106
5.8	Official technical dossier.....	108
5.8.1	General	108

This is a preview of "BS EN 13814-1:2019". [Click here to purchase the full version from the ANSI store.](#)

5.8.2	Content	108
5.8.3	Identification marking	109
	Annex A (normative) Electrical equipment and control systems	110
A.1	Electrical equipment	110
A.1.1	General	110
A.1.2	Protection against electric shocks	110
A.1.3	Protection against lightning	111
A.1.4	Lighting	111
A.1.5	Generators	112
A.1.6	Heaters and light fittings	112
A.1.7	Communication system	112
A.2	Control Systems	112
A.2.1	General	112
A.2.2	Safety-related control functions	113
A.2.3	Safety-related parameters	114
A.2.4	Passenger restraints	115
A.2.5	Fall Prevention	116
A.2.6	Inhibiting of safety functions	117
A.2.7	Operating modes	118
A.2.8	Collision prevention safety function	120
	Annex B (informative) Control systems - Best practices	122
B.1	Security	122
B.2	Example block zone logic	122
B.3	Requirements for the positioning of sensors and stopping devices	122
	Annex C (informative) Guidance on design of passenger containment	124
	Annex D (informative) Amusement Device Log for an amusement device	129
	Annex E (informative) List of main hazards, hazardous situations and events for spectators and passengers during the operation and use of amusement rides	150
	Annex F (informative) Guest behaviour	154
F.1	Scope	154
F.2	Terms and definitions	154
F.2.1	General	154
F.2.2	Boarding passengers	154
F.2.3	Riding passengers	154
F.2.4	Exiting passengers	154
F.2.5	Waiting passenger	154
F.2.6	Behaviour	154

This is a preview of "BS EN 13814-1:2019". [Click here to purchase the full version from the ANSI store.](#)

F.2.7	Foreseeable behaviour	154
F.2.8	Parent or Supervision Companion	155
F.2.9	Child	155
F.2.10	Information to public	155
F.2.11	Parents or Supervision Companions accompanying children	155
F.3	Classification of age and basic capabilities	155
F.4	Human factors	157
F.5	General Strategy of Risk mitigation in Guest Behaviour	157
F.5.1	General	157
F.5.2	Adults	157
F.5.3	Refusal of access	158
F.5.4	Normal Behaviour	158
F.5.5	Unacceptable behaviour	158
	Annex G (informative) Limited accessibility to amusement devices	159
	Annex H (informative) Safety envelope for passengers	161
H.1	Design Criteria	161
H.2	Anthropometric Basis	161
H.3	Methods for Defining Safety Envelope Boundaries	161
H.3.1	Documentation	161
H.3.2	Prerequisites	162
H.3.3	Safety envelopes	162
H.3.4	Hazards and related safety envelope class	162
	Annex I (informative) Acceleration effects on passengers	164
I.1	Medical tolerance - General	164
I.2	Rides	165
I.2.1	General	165
I.2.2	General Definitions and Limitations	165
I.2.3	Acceleration in X-Direction	165
I.2.4	Acceleration in Y-Direction	166
I.2.5	Acceleration in Z-direction (parallel to Spine)	167
I.2.6	Combinations	168
I.3	Reversals	169
I.3.1	Reversals in X and Y	169
I.3.2	Transitions in Z	170
I.4	Example obtaining admissible accelerations	172
	Bibliography	174

This is a preview of "BS EN 13814-1:2019". [Click here to purchase the full version from the ANSI store.](#)

European foreword

This document (EN 13814-1:2019) 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 second and third 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.

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Introduction

The object of this document is to define safety rules related to structures and machinery, which are either an integral part of, or constitute the amusement device itself. The safety rules are intended to safeguard persons against the risk of accidents caused by deficiencies in design, manufacture and operation of such structures and machinery.

Annex A (normative) provides guidance on electrical equipment and control systems

Annex B (informative) provides control systems – best practices

Annex C (informative) provides guidance of passenger containment

Annex D (informative) shows a typical layout of a device log for an amusement device

Annex E (informative) lists hazards pertaining to amusement rides

Annex F (informative) provides guidance on guest behaviour

Annex G (informative) provides guidance on the limited accessibility to amusement devices

Annex H (informative) provides guidance on the safety envelope for passengers

Annex I (informative) explains acceleration effects on passengers

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1 Scope

This document specifies the minimum requirements necessary to ensure the safe design, calculation, manufacture, and installation of mobile, temporary or permanently installed machinery and structures which are intended for use by persons as a leisure activity, e.g. roundabouts, swings, boats, ferris wheels, roller coasters, chutes, booths, side shows, and structures for artistic aerial displays. The above items are hereafter called 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. 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 wall, inflatable, trampolines, swimming pool equipment (this list is not exhaustive) are not covered by this document.

For all the equipment not covered by the requirements of EN 13814-1, the relevant standards apply.

Nevertheless this document can be used in the design of any similar structural or passenger carrying amusement device not explicitly mentioned herein.

In terms of workers' health and safety, national regulations apply.

This document is applicable to manufacturing and major modification of amusement devices and rides for designs after the effective date of publication.

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 349, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 818 (all parts), *Short link chain for lifting purposes — Safety*

EN 1090-2:2018, *Execution of steel structures and aluminium structures — Part 2: Technical requirements for steel structures*

EN 1090-3:2008, *Execution of steel structures and aluminium structures — Part 3: Technical requirements for aluminium structures*

EN 1176 (all parts), *Playground equipment and surfacing*

EN 1991-1-4, *Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions*

EN 1993-1-1, *Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings*

EN 1993-1-8, *Eurocode 3: Design of steel structures - Part 1-8: Design of joints*

EN 1993-1-9, *Eurocode 3: Design of steel structures - Part 1-9: Fatigue*

EN 1999-1-1, *Eurocode 9: Design of aluminium structures — Part 1-1: General structural rules*

EN 10204, *Metallic products - Types of inspection documents*

EN 12195-2, *Load restraint assemblies on road vehicles - Safety - Part 2: Web lashing made from man-made fibres*