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European foreword

This document (EN 13814-1:2019+A1:2024) 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of an identical text or by endorsement, at the latest by January 2025, and conflicting national standards shall be withdrawn at the latest by July 2027.

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 includes Amendment 1 approved by CEN on 7 June 2024.

This document [A1] supersedes EN 13814-1:2019 [A1].

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] [A1].

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.

QUESTO DOCUMENTO È UNA PREVIEW. RIPRODUZIONE VIETATA

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

QUESTO DOCUMENTO È UNA PREVIEW. RIPRODUZIONE VIETATA

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*

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