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Rulletrapper og rullefortove – Sikkerhed – Del 1: Konstruktion og installation

Safety of escalators and moving walks –
Part 1: Construction and installation

DANSK STANDARD
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EUROPEAN STANDARD **EN 115-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM July 2017

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English Version

Safety of escalators and moving walks - Part 1: Construction and installation

Sécurité des escaliers mécaniques et trottoirs roulants - Partie 1: Construction et installation

Sicherheit von Fahrtreppen und Fahrsteigen - Teil 1: Konstruktion und Einbau

This European Standard was approved by CEN on 1 May 2017.

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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.

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

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European foreword

This document (EN 115-1:2017) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by January 2018, and conflicting national standards shall be withdrawn at the latest by January 2019.

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 supersedes EN 115-1:2008+A1:2010.

The need for a replacement was based on the following points:

a) improvement in safety due to changes in proven technology;

b) the need to reflect changes to the state of the art;

- new structure for electric requirements with clauses for protective, safety and control devices and functions;
- requirements for step inserts/fixings;
- expansion of operational brake by electrical braking;
- update on test material for skirting;
- inclusion of fire protection requirements;
- introduction of 2-direction-mode;
- inclusion of a stop switch indicator;
- introduction of inspection control actuated by the use of both hands;
- description of barriers to prevent access of trolley;
- requirements for fixed devices in the unrestricted area;
- inclusion of seismic design requirements;

c) incorporation of essential health and safety requirements from the relevant EU Directives;

d) elimination of reported errors;

e) clarification of the text and incorporation of proposals resulting from interpretation requests [1]);

f) improvement of the references to other standards according to the progress in that field;

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1) Within CEN/TC 10 an interpretation committee has been established to answer questions about the spirit in which the experts have drafted the various clauses of this standard. All such interpretations are published within CEN/TS 115-4 [1] until incorporated by amendment into the standards concerned.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directives.

For relationship with EU Directives, see informative Annex ZA, which are integral parts of this document.

This standard is part of the EN 115 series of standards: *"Safety of escalators and moving walks".*

EN 115 is currently composed with the following parts:

— *Part 1: Construction and installation* [the present document];

— *Part 2: Rules for the improvement of safety of existing escalators and moving walks;*

— *Part 3: Correlation between* EN 115:1995 *and its amendments and* EN 115-1:2008 [Technical Report];

— *Part 4: Interpretations related to* EN 115 *family of standards* [Technical Specification].

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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.

This document is a type-C standard as stated in EN ISO 12100:2010.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium, and large enterprises);

— health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e.g. for maintenance (small, medium and large enterprises);

— consumers (in the case of machinery intended for use by consumers).

The above mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or -B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

The purpose of this standard is to define safety requirements for escalators and moving walks in order to safeguard people and objects against risks of accidents during installation, operation, maintenance and inspection work.

The contents of this standard are based on the assumption that persons using escalators and moving walks are able to do so unaided. However, physical and sensory abilities in a population can vary over a wide range, escalators and moving walks are also likely to be used by persons with a range of other disabilities.

Some individuals, in particular older people, might have more than one impairment. Some individuals are not able to use an escalator or moving walk independently and rely on assistance/support being provided by a companion. Furthermore some individuals can be encumbered by objects or be responsible for other persons, which can affect their mobility. The extent to which an individual is incapacitated by impairments and encumbrances often depends on the usability of products, facilities and the environment.

The use of wheelchairs on escalators and moving walks can lead to dangerous situations which cannot be mitigated by machine designs and therefore should not be permitted.

The use of lifts is the preferred method of vertical travel for most people with disabilities and in particular wheelchair users and persons with guide dogs.

Additional signs should be provided to indicate the location of other facilities, these facilities should be in close proximity to the escalators and moving walks and easy to find.

The risks arising from the configuration of escalators and moving walks within a building (e.g. obstructions or voids adjacent to escalators) should be risk assessed according to methodology of the

eliminate hazards or reduce risk to an acceptable level.

It is assumed that negotiations have been made for each contract between the customer and the supplier/installer (see also Annex A) about:

a) intended use of the escalator or moving walk;

b) environmental conditions;

c) civil engineering problems;

d) other aspects related to the place of installation.

Planning of traffic flows and evacuation/rescue purposes are under the responsibility of the building designer/owner.

If escalators or moving walks are intended to be operated under special conditions, such as directly exposed to the weather or explosive atmosphere, or in exceptional cases serve as emergency exits, appropriate design criteria, components, materials and instructions for use should be used that satisfy the particular conditions.

An Interpretation Committee has been established to clarify, if necessary, the spirit in which the clauses of the standard have been drafted and to specify the requirements appropriate to particular cases. Interpretation Requests can be sent to the National Standard Bodies which will contact the responsible Technical Committee CEN/TC 10. The formats of an interpretation request and the interpretation are given in Annex N.

This European Standard is applicable for new escalators and moving walks (pallet or belt type) as defined in Clause 3.

This European Standard deals with all significant hazards, hazardous situations and events relevant to escalators and moving walks when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4).

This European Standard is not applicable to escalators and moving walks which were manufactured before the date of its publication. It is, however, recommended that existing installations be adapted to this standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1929-2:2004, *Basket trolleys — Part 2: Requirements, tests and inspection for basket trolleys with or without a child carrying facility, intended to be used on passenger conveyors*

EN 1929-4:2005, *Basket trolleys — Part 4: Requirements and tests for basket trolleys with additional goods carrying facility(ies), with or without a child carrying facility, intended to be used on passenger conveyors*

EN 1990:2002[2], *Eurocode — Basis of structural design*

EN 1993-1-1:2005, *Eurocode 3: Design of steel structures — Part 1-1: General rules and rules for buildings*

EN 1998-1:2004, *Eurocode 8: Design of structures for earthquake resistance — Part 1: General rules, seismic actions and rules for buildings*

EN 10025-1:2004, *Hot rolled products of structural steels — Part 1: General technical delivery conditions*

EN 10025-2:2004, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*

EN 10025-3:2004, *Hot rolled products of structural steels — Part 3: Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels*

EN 10025-4:2004, *Hot rolled products of structural steels — Part 4: Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels*

EN 10025-5:2004, *Hot rolled products of structural steels — Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance*

EN 10025-6:2004+A1:2009, *Hot rolled products of structural steels — Part 6: Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition*

EN 10083-1:2006, *Steels for quenching and tempering — Part 1: General technical delivery conditions*

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2) This standard is currently impacted by the amendment EN 1990:2002/A1:2005.

alloy steels

EN 10083-3:2006, *Steels for quenching and tempering — Part 3: Technical delivery conditions for alloy steels*

EN 12015:2014, *Electromagnetic compatibility — Product family standard for lifts, escalators and moving walks — Emission*

EN 12016:2013, *Electromagnetic compatibility — Product family standard for lifts, escalators and moving walks — Immunity*

EN 13501-1:2007+A1:2009, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 60068-2-6:2008, *Environmental testing — Part 2-6: Tests — Test Fc: Vibration (sinusoidal) (IEC 60068-2-6:2007)*

EN 60068-2-14:2009, *Environmental testing — Part 2-14: Tests — Test N: Change of temperature (IEC 60068-2-14:2009)*

EN 60068-2-27:2009, *Environmental testing — Part 2-27: Tests — Test Ea and guidance: Shock (IEC 60068-2-27:2008)*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2006, modified)*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60664-1:2007, *Insulation coordination for equipment within low-voltage systems — Part 1: Principles, requirements and tests (IEC 60664-1:2007)*

EN 60947-4-1:2010[3] , *Low-voltage switchgear and controlgear — Part 4-1: Contactors and motor-starters — Electromechanical contactors and motor-starters (IEC 60947-4-1:2009)*

EN 60947-5-1:2004[4] , *Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices (IEC 60947-5-1:2004)*

EN 61249 (all parts), *Materials for printed boards and other interconnecting structures (IEC 61249, all parts)*

EN 62061:2005[5] , *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2005)*

EN 62326-1:2002, *Printed boards — Part 1: Generic specification (IEC 62326-1:2002)*

EN ISO 868:2003, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)*

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3) This standard is currently impacted by the amendment EN 60947-4-1:2010/A1:2012.

4) This standard is currently impacted by the amendment EN 60947-5-1:2004/A1:2009.

5) This standard is currently impacted by the amendment EN 62061:2005/A1:2013.

reduction (ISO 12100:2010)

EN ISO 13850:2015, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)*

EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

ISO 3864-1:2011, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 3864-3:2012, *Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs*

HD 60364-4-41:2007, *Low-voltage electrical installations — Part 4-41: Protection for safety — Protection against electric shock*

3 Terms and definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

3.1.1
angle of inclination
maximum angle to the horizontal in which the steps, the pallets or the belt move

3.1.2
authorized person
suitably trained person with authorization to access restricted areas of escalators and moving walks (e.g. machinery spaces, separate machine rooms) and to work there for the purpose of inspection, testing and maintenance

Note 1 to entry: Authorized persons should be competent for the tasks they have been authorized for (see also 3.1.8).

3.1.3
balustrade
part of the escalator/moving walk which ensures the user's safety by providing stability, protecting from moving parts and supporting the handrail

3.1.4
balustrade decking
transverse member of the balustrade which meets the handrail guidance profile and which forms the top cover of the balustrade

3.1.5
brake load
load on the step/pallet/belt which the brake system is designed to stop the escalator/moving walk

3.1.6
comb
pronged section at each landing that meshes with the grooves