SLOVENSKI STANDARD
oSIST prEN 115-1:2015

01-oktober-2015

Varnost tekočih stopnic in tekočih stez - 1. del: Konstrukcija in vgradnja

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

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

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

Ta slovenski standard je istoveten z: **prEN 115-1**

ICS:

91.140.90 Dvigala. Tekoče stopnice Lifts. Escalators

oSIST prEN 115-1:2015 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 115-1

August 2015

ICS 91.140.90

Will supersede EN 115-1:2008+A1:2010

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 draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 10.

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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

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Foreword

This document (prEN 115-1:2015) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 115-1:2008+A1:2010.

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 Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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;

   1) new structure for electric requirements with clauses for protective, safety and control devices and functions;

   2) requirements for step inserts;

   3) expansion of braking by other means;

   4) update on test material for skirting;

   5) inclusion of fire protection requirements;

   6) introduction of 2-direction-mode;

   7) inclusion of a stop switch indicator;

   8) description of barriers to prevent access of trolley;

   9) requirements for fixed devices in the unrestricted area;

   10) 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;

g) adaption to CEN Guide 414:2014.

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 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].

Introduction

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. Also it is considered that they are wearing footwear and no clothes that can be trapped across the step/pallet (e.g. ankle-length clothing products). 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.

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.

NOTE Planning of traffic flows and evacuation/rescue purposes are under the responsibility of the 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 L.

1 Scope

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

This draft 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).

1.2 This document 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, *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*

EN 10083-2:2006, *Steels for quenching and tempering — Part 2: Technical delivery conditions for non alloy steels*

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

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

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 13015:2001, *Maintenance for lifts and escalators — Rules for maintenance instructions*

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 60269-1:2007[3)], *Low-voltage fuses — Part 1: General requirements (IEC 60269-1:2006)*

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 60747-5-5:2011, *Semiconductor devices — Discrete devices — Part 5-5: Optoelectronic devices — Photocouplers (IEC 60747-5-5:2007)*

EN 60947-4-1:2010[4)], *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[5)], *Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices (IEC 60947-5-1:2003)*

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

EN 61558-1:2005, *Safety of power transformers, power supplies, reactors and similar products — Part 1: General requirements and tests (IEC 61558-1:2005)*

EN 62061:2005[6)], *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)*

3) This standard is currently impacted by the amendment EN 60269-1:2007/A1:2009 and EN 60269-1:2007/A2:2014.

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

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

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

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

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13850:2008, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)*

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 (IEC 60364- 4-41:2005, modified)*

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

3.1.3
balustrade decking
transverse member of the balustrade which meets the handrail guidance profile and which forms the top cover of the balustrade

3.1.4
brake load
load on the step/pallet/belt which the brake system is designed to stop the escalator/moving walk

3.1.5
comb
pronged section at each landing that meshes with the grooves

3.1.6
comb plate
platform at each landing to which the combs are attached

3.1.7
safety system
safety related part of the electrical control system as an arrangement of safety circuits and monitoring devices

3.1.8
safety devices
part of a safety circuit consisting of safety switches and/or fail safe circuits

3.1.9
escalator
power-driven, inclined, continuous moving stairway used for raising or lowering persons in which the user carrying surface (e.g. steps) remains horizontal

Note 1 to entry: Escalators are machines - even when they are out of operation - and cannot be considered as fixed staircases.

3.1.10
exterior panel
part of the exterior side of the enclosure of an escalator or moving walk

3.1.11
fail safe circuit
safety related electrical and/or electronic system with defined failure mode behaviour

3.1.12
handrail
power-driven moving rail for persons to grip while using the escalator or moving walk

3.1.13
interior panel
panel located between the skirting or lower inner decking and the handrail guidance profile or balustrade decking

3.1.14
lower inner decking
profile that connects the skirting with the interior panel when they do not meet at a common point

3.1.15
lower outer decking
profile that connects the exterior panels with the interior panel

3.1.16
machinery
escalator or moving walk machine(s) mechanisms and associated equipment

3.1.17
machinery spaces
space(s) inside or outside of the truss where the machinery as a whole or in parts is placed

3.1.18
maximum capacity
maximum flow of persons that can be achieved under operational conditions

3.1.19
moving walk
power-driven installation for the conveyance of persons in which the user carrying surface remains parallel to its direction of motion and is uninterrupted (e.g. pallets, belt)

Note 1 to entry: Moving walks are machines - even when they are out of operation – and should not be used as a fixed access.