SLOVENSKI STANDARD
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Varnost tekoļ ih stopnic in trakov za osebe (stez) - 2. del: Pravila za izboljġanje varnosti obstojeļ ih stopnic in trakov za osebe

Safety of escalators and moving walks - Part 2: Rules for the improvement of safety of existing escalators and moving walks

Sicherheit von Fahrtreppen und Fahrsteigen - Teil 2: Regeln für die Erhöhung der Sicherheit bestehender Fahrtreppen und Fahrsteige

Sécurite des escaliers mécaniques et trottoirs roulants - Partie 2: Règles pour l'amélioration de la sécurité des escaliers mécaniques et des trottoirs roulants existants

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Safety of escalators and moving walks - Part 2: Rules for the improvement of safety of existing escalators and moving walks

Sécurite des escaliers mécaniques et trottoirs roulants - Partie 2: Règles pour l'amélioration de la sécurité des escaliers mécaniques et des trottoirs roulants

Sicherheit von Fahrtreppen und Fahrsteigen - Teil 2: Regeln für die Erhöhung der Sicherheit bestehender Fahrtreppen und Fahrsteige

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Foreword

This document (prEN 115-2:2009) 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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

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

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

Introduction

Background of this standard

More than 75 000 escalators and moving walks are in use today in EU and EFTA and almost 50 % were installed more than 20 years ago. However, this standard compares the safety level of escalators and moving walks installed after 1970 with those from EN 115-1:2008. This recognises that the first attempt to have a common standard for escalators and moving walks was the CIRA Recommendation 28 [1]. Escalators and moving walks were installed to the safety level appropriate at that time. This level is less than today's state of the art for safety.

New technologies and social expectations have led to today's state of the art for safety. This has led to the situation today of different levels of safety across Europe causing accidents. However, users and authorised persons expect a common acceptable level of safety.

Furthermore the life cycle of escalators and moving walks is longer than most other transportation systems and building equipment, which therefore means that the design, performance and safety can fall behind modern technologies. If all existing escalators and moving walks are not upgraded to today's state of the art of safety the number of injuries will increase (especially in areas which can be accessed by the general public, recognizing the change of behaviour and changing attitudes towards safety in general). If escalators or moving walks were installed before 1970 on the base of manufacturer's and national standards or were installed after 1970 but not in accordance with CIRA Recommendation 28, then they should be the subject of a separate risk assessment in addition to the recommendations of this standard to determine whether a safety upgrade or a full replacement is appropriate.

Approach of this standard

This standard

— categorises various hazards and hazardous situations, each of which has been analysed by a risk assessment (see in particular Annex A);

— is intended to provide corrective actions to progressively and selectively improve, step by step, the safety of all existing escalators and moving walks towards today's state of the art for safety (see Clause 5);

— enables each escalator and moving walk to be audited and safety measures to be identified and implemented in a step by step and selective fashion according to the frequency and severity of any single risk (see Table B.2);

— lists the high, medium and low risks and corrective actions which can be applied in separate steps in order to eliminate the risks (see Table B.2).

Other designs to previous national regulations or standards, providing they have an equivalent safety level, may be acceptable.

Use of this standard

This standard can be used as a guideline for:

a) national authorities to determine its own programme of implementation in a step by step process via a filtering process (see Annex A) in a reasonable and practicable[1)] way based on the level of risk (e.g. high, medium, low) and social and economic considerations;

b) owners to follow their responsibilities according to existing regulations (e.g. Use of Work Equipment Directive);

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1) "Reasonable and practicable" is defined as follows: "In deciding what is reasonably practicable the seriousness of a risk to injury should be weighted against the difficulty and cost of removing or reducing that risk. Where the difficulty and costs are high, and a careful assessment of the risk shows it to be comparatively unimportant, action may not need to be taken. On the other hand where the risk is high, action should be taken at whatever cost."

c) maintenance companies and/or inspection bodies to inform the owners on the safety level of their installations;

d) owners to upgrade the existing escalator or moving walk on a voluntary basis in accordance with c) if no regulations exist.

In making an audit of an existing escalator or moving walk installation Annex B can be used to identify the hazards and corrective actions in this standard. However, where a hazardous situation is identified which is not covered in this standard a separate risk assessment should be made. This risk assessment should be based on ISO/TS 14798 [2].

1 Scope

1.1 This European Standard gives rules for improving the safety of existing escalators and moving walks with the aim of reaching an equivalent level of safety to that of a newly installed escalator and moving walk by the application of today's state of the art for safety.

NOTE Due to situations such as the existing machine or building designs, it may not be possible in all cases to reach today's state of the art for safety. Nevertheless the objective is to improve the level of safety wherever possible.

1.2 This standard includes the improvement of safety of existing escalators and moving walks for:

a) users;

b) maintenance and inspection personnel;

c) persons outside the escalator or moving walk (but in their immediate vicinity);

d) authorised persons.

1.3 This standard is not applicable to:

a) safety during transport, installation, repairs and dismantling of escalators and moving walks;

b) spiral escalators;

c) accelerating moving walks.

However, this standard can usefully be taken as a reference basis.

2 Normative references

The following referenced documents are indispensable for the application 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 115-1:2008, *Safety rules for the construction and installation of escalators and moving walks*

EN 60204-1:1998, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2005, modified)*

EN ISO 12100-1:2003, *Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

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

EN ISO 13857:2006*, Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs*.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1, EN 115-1 and the following apply.

3.1
authorised person
person with a permission from the owner of the installation to perform defined activities

3.2
existing escalator or moving walk
escalator or moving walk which is in service at the disposal of its owner

3.3
owner of the installation
natural or legal person who has the power of disposal of the installation and takes the responsibility for its operation and use

4 List of significant hazards

4.1 General

This clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this standard, identified by risk assessments as significant for existing escalators and moving walks and which require action to eliminate or reduce the risk.

4.2 Significant hazards dealt with by this standard

Table 1 below contains a list of significant hazards including their categories, priority levels and relevant clauses of the present standard.

Table 1 — List of significant hazards

Nr.	Hazard/Hazardous situation	Priority level	Relevant Clause EN 115-2
1	Affect of harmful materials subject to wear (e.g. asbestos in the brake lining)	H	5.1
2	Contact with moving machinery parts (e.g. driving unit, handrail drive, step or pallet) normally not accessible to the public	M	5.2.1, 5.4.1, 5.12.2, 5.13.2.1
3	Fire inside the supporting structure and machinery spaces	M	5.2.2, 5.9
4	Slipping on steps/pallets/belt and landing areas	H	5.3.1, 5.7.1
5	Falling due to insufficient step demarcation	M	5.3.2
6	Trapping between skirting and steps	H	5.3.3, 5.5.3
7	Trapping between step and step or pallet and pallet	H	5.3.4
8	Missing steps or pallets	H	5.3.5
9	Collision between fixed and moving parts of the step/pallet/belt system	M	5.3.6
10	Missing of at least two independent main contactors	H	5.4.1, 5.4.2.3
11	Excessive speed and unintended reversal of direction	M	5.4.2.1, 5.4.2.2, 5.4.2.5
12	Effect of excessive stopping distance	L	5.4.2.4
13	Falling due to reduced stopping distance	H	5.4.2.6
14	Falling over the balustrade	M	5.5.2.1, 5.5.2.2
15	Sliding on the outside of the balustrade	L	5.5.2.3
16	Climbing on the outside of the balustrade or falling from the landing	H	5.5.2.3, 5.13.1.6
17	Falling due to handrail speed deviation	M	5.6.1
18	Crushing of fingers between handrail and balustrade	H	5.6.2
19	Drawing-in at handrail entry into the balustrade	H/M	5.6.3.1
20	Trapping at handrail entry (between handrail and floor)	M	5.6.3.2
21	Trapping between comb and step/pallet	H	5.7.2, 5.7.3
22	Trapping of users resulting from sagging of the step/pallet	H	5.7.4
23	Miscellaneous equipment in workers' area not related to the installation	M	5.8.1

Table 1 — *(continued)*

Nr.	Hazard/Hazardous situation	Priority level	Relevant Clause EN 115-2
24	Insufficient space in workers' area	H	5.8.2, 5.13.2.4, 5.13.2.5, 5.13.2.6
25	Missing lifting equipment for heavy loads	M	5.8.3
26.1	Missing lighting in the workers' area and access to it	H	5.8.4
26.2	Inadequate lighting in the workers' area and access to it	M	5.8.4, 5.13.2.2, 5.13.2.3
27.1	Missing emergency stopping device (working area)	H	5.8.5
27.2	Inadequate emergency stopping device (working area)	L	5.8.5
28	Contact of persons with live parts - Insufficient isolation	H	5.11.1.1, 5.13.3
29	Contact of persons with live parts – Isolation failure	H	5.11.1.2, 5.11.1.3, 5.13.3
30.1	Unsafe working conditions due to missing main switch	H	5.11.2
30.2	Unsafe working conditions due to or inadequate main switch	M	5.11.2
31	Electrostatic discharge from moving components	L	5.11.3
32.1	Missing stop switch for emergency situation	H	5.12.1
32.2	Inadequate stop switch for emergency situation	M	5.12.1
33	Impact on bodies caused by collision with building structures (wall, roof, criss-cross arrangement)	H	5.13.1.1, 5.13.1.2, 5.13.1.3
34	Crushing due to restricted circulation areas	M	5.13.1.4
35	Creation of traffic jam at blocked exits or intermediate exits of escalators or moving walks	L	5.13.1.5
36	Falling due to inadequate lighting at the landings	M	5.13.1.7
37	Missing safety signs	M	5.14
38.1	Missing devices to prevent misuse of escalators by transporting other items than persons (e.g. shopping trolleys or baggage carts)	H	5.15.1
38.2	Inadequate devices to prevent use of trolleys or baggage carts on escalators	M	5.15.1
39	Crushing due to incompatible trolleys on moving walks	L	5.15.2

4.3 Significant hazards not dealt with by this standard

— environmental conditions including e.g. earthquake and flooding;

— electromagnetic interferences;

— shearing due to sharp edges;

— non-conformance with national building codes;

— fire in the building.

5 Safety requirements and/or protective measures

5.1 General

The following requirements and/or protective measures shall not be considered as the only possible solution. Alternatives are permitted, provided they lead to an equivalent safety level.

A risk assessment shall be made on a case by case basis for safety items not covered in this standard.

Where the requirements of this standard cannot be met technically and a residual risk remains, or cannot be avoided, the level of risk shall be reduced as far as it is practicable. When residual risk remains the use of appropriate procedures such as signs, instructions and training should be considered.

Harmful materials such as asbestos in brake linings, contactor shields, cladding including machinery spaces and separate machine rooms or control cabinet locations, etc. shall be replaced by materials which ensure the same performance level.

NOTE These should be considered in relation to national requirements.

For specific requirements such as accessibility, the conditions in the building shall be checked to see what is practical to be applied for escalators and moving walks.

If an escalator or moving walk has been upgraded by one of the measures described in this standard, the consequences to other parts of the escalator or moving walk shall be considered with special regard to EN 115-1:2008.

5.2 Supporting structure (truss) and enclosure

5.2.1 General

All mechanically moving parts of the escalator or moving walk shall be completely enclosed within panels or walls. Exempt from this are the accessible steps, the accessible pallets, the accessible belt and that part of the handrail available for the user. Ventilation apertures in compliance with Table 5 of EN ISO 13857:2008 are permitted.

Exterior panels which are designed to be opened (e.g. for cleaning purposes), inspection covers and floor plates shall be provided with an electric safety device according to EN 115-1:2008, Table 6 n). For inspection covers and floor plates it shall only be possible to open them by a key or a tool suited for that purpose.

If rooms behind inspection covers and floor plates can be entered, it shall be possible to open them from the inside without a key or a tool even when locked.

It is permissible to omit an enclosure of the mechanically moved parts if other measures (such as rooms with locked doors accessible to authorised personnel only) make a hazard to the public impossible.

5.2.2 Fire hazard

5.2.2.1 Accumulation of combustible material inside the truss due to the daily environmental pollution can generate a fire hazard. Therefore, the inner part of the escalator/moving walk shall be cleaned regularly. Written Instructions and checks shall be available.

5.2.2.2 Depending on the maintenance conditions, e.g. access, fire protection systems shall be installed.

5.3 Steps, pallets and belt

5.3.1 Tread surfaces for escalators and moving walks shall provide a secure foothold taking into consideration the surrounding environment.

5.3.2 Demarcation (e.g. groove in the step tread) shall be provided to highlight at the landings the rear edge of the steps.

5.3.3 The lateral displacement of the steps or pallets out of their guiding system shall not exceed 4 mm at either side and 7 mm for the sum of clearances measured at both sides.

The vertical displacement shall not exceed 4 mm for steps and pallets and 6 mm for belts.

5.3.4 Clearances for steps with cleated risers and pallets with meshing front and rear edges shall not exceed 6 mm between two consecutive steps or pallets in any usable position measured at the tread surface.

Clearances for steps with plain risers and pallets without meshing shall not exceed 5 mm between two consecutive steps or pallets in any usable position measured at the tread surface.