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Safety of travelators for winter sport or tourist use

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/24

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NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15700

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ICS 91.140.90 Supersedes EN 15700:2011

English Version

Safety for conveyor belts for winter sport or tourist use

Sécurité des tapis roulants pour les activités de sports d'hiver ou de loisirs

Sicherheit von Bandförderern für Wintersport- oder Freizeitaktivitäten

This European Standard was approved by CEN on 12 September 2022.

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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 15700:2023) has been prepared by Technical Committee CEN/TC 242 "Safety requirements for passenger transportation by rope", 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of an identical text or by endorsement, by February 2024 at the latest, and all conflicting national standards shall be withdrawn no later than February 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights or similar rights. CEN and/or CENELEC shall not be held responsible for identifying all or some of these patent rights.

This document supersedes EN 15700:2011.

Compared with the preceding version of the standard, the main changes are as follows:

- Added requirements for high-speed travelators (0,7 <v≤ 1,2 m/s): specifically, increase in the safety volume under the safety flaps;
- Added construction and fire protection requirements for the tunnels installed to protect users and the equipment from weather;
- Added requirements for maintenance activities: a maintenance mode is provided to allow operators to perform travelator maintenance operations safely with the movable guard open;
- A clearer boundary between the machinery and its location in the environment.

The detailed changes compared with EN 15700:2011 are as follows:
— Subclause 1 has been supplemented with wording concerning the type of passengers.
— Subclause 2 has been supplemented with normative references.
— Subclause 3 has been supplemented with terms and definitions.
— Subclause 4 has been supplemented with an annex listing the significant hazards.
— In 5.1, the general safety requirements and/or safety measures, general safety distances and general requirements for guards have been supplemented.
— In 5.2.1, the general requirement for the travelator installation to adapt to the terrain has been clarified.
— In 5.2.2.3 (formerly 5.2.3.3), the boarding plate gradient requirement has been changed.
— In 5.2.2.4 (formerly 5.2.3.4), the alighting plate gradient requirement has been changed.
— In 5.2.3.1, general cross section requirements have been added.
— In 5.2.3.2 (formerly 5.2.4.1), the requirement for the transverse gradient of the conveyor belt has been supplemented.
— In 5.2.3.3 (formerly 5.2.4.2), the requirements for the space free of any obstacle have been supplemented.
— In 5.2.3.4 (formerly 5.2.4.3), the requirements for the distance from the side wall and the inner edge of the guide and motorised handrails have been supplemented.
— In 5.2.3.5, the requirements for free space above the level of the conveyor belt if the system only carries pedestrians have been supplemented.
— In 5.2.3.5, the requirements for objects allowed in the free space have been supplemented.
— In 5.2.4 (formerly 5.2.5), the conveyor belt speed requirements have been supplemented.
— In 5.3.2.1, the requirements for conveyor belt guides have been supplemented.
— In 5.3.2.2, the passenger guide requirements have been supplemented.
— In 5.3.3, the covering requirements have been supplemented.
— In 5.3.4, the requirements for the safety flap have been added for consistency with 5.3.5.
— In 5.3.5, guidance on the emergency flaps of high-speed travelators has been added.

— Subclause 5.3.6, detailing brush requirements, has been added.
— Subclause 5.3.7, detailing the size requirement for the drum or wheel at the alighting station, has been added.
— In 5.4.1, the general requirements for electrical installations have been supplemented.
— In 5.4.2, the requirement for the safety function of the manual reverse drive of the conveyor belt has been added.
— In 5.4.3, requirements for the start-up of the travelator after a stop without automatic restart have been supplemented.
— In 5.5.2, the general requirements for travelator stops have been supplemented.
— In 5.5.2.3, the general requirements for travelator emergency stops have been supplemented.
— Subclause 5.5.2.3.2, explaining the requirements for emergency stops of standard-speed travelators, has been added.
— Subclause 5.5.2.3.3, explaining the requirements for emergency stops of high-speed travelators, has been added.
— Subclause 5.5.2.4, explaining the general requirements for emergency stops with extended stop distance, has been added.
— Subclause 5.5.2.4.1, explaining the general requirements for emergency stops with extended stop distance for standard-speed travelators, has been added.
— Subclause 5.5.2.4.2, explaining the general requirements for emergency stops with extended stop distance for high-speed travelators, has been added.
— In 5.5.2.5, a requirement for brakes has been added.
— Subclause 5.5.3.2.2, explaining the maintenance requirements for emergency stops, has been added.
— Subclause 5.5.3.2.3, explaining the operation requirements for emergency stops, has been added.
— In 5.5.3.3, the timings of the flow management device at the destination point have been supplemented based on the speed of the travelator.
— In 5.5.3.4, the timings of the fall management device at the destination point have been supplemented based on the speed of the travelator.
— In 5.5.3.5, the automatic restart of the conveyor belt after a stop by any of the devices specified in 5.5.3.3 and 5.5.3.4 has been clarified. In addition, a requirement relating to lighting and sunlight has been added.
— Subclause 5.5.4.2, explaining the common requirements for the safety flaps of standard-speed travelators and high-speed travelators, has been added.
— Subclause 5.5.4.3, explaining the specific requirements for the safety flaps of standard-speed travelators, has been added.
— Subclause 5.5.4.4, explaining the specific requirements for the safety flaps of high-speed travelators, has been added.
— In 5.5.4.5 (formerly 5.5.5), the conditions required for automatic restart after a stop linked to the opening of the safety flap have been supplemented.
— In 5.5.5 (formerly 5.5.4.3), the requirements for the access flaps located immediately after the safety flap in high-speed travelators have been supplemented.
— Subclause 5.6.1, explaining the specific requirements for travelators with combined alighting, has been added.
— Subclause 5.6.2, explaining the specific requirements for travelators with side alighting only, has been added.
— Subclause 5.7, detailing specific requirements for tunnels, has been added.
— Subclause 5.7.4 "equipment interlocking" has been deleted, as its requirements are specified in Subclause 5.9.3.
— Subclause 5.8.1, explaining the general requirements in 5.8 (formerly 5.6), has been added.
— In 5.8.2 (formerly 5.6.1 and 5.6.2), the term "control box" has been renamed "workstation". In addition, the workstation requirements have been supplemented.
— In 5.8.3 (formerly 5.6.3), the purpose of the reset has been supplemented.
— Subclause 5.9.1.1, detailing the general requirements of Subclause 5.9.1 (formerly 5.7.1) for the safety of personnel and users, has been added.

— Subclause 5.9.1.2, detailing the requirements for fixed guards, movable guards and the specific "maintenance run" control mode, has been added.
— Subclause 5.9.1.3, explaining the requirements for lighting for maintenance operations, has been added.
— In 5.9.3 (formerly 5.7.3), the type of main switch has been specified.
— In 5.9.4 (formerly 5.7.5), the requirements for protection against electrical currents and atmospheric electricity have been supplemented.
— In 5.10.1.2 (formerly 5.8.1.2), the requirements for justification of the strength of drum pins and shafts, boarding plates, alighting plates, the safety flap, walks and the tunnel have been added.
— In 5.10.1.3 (formerly 5.8.1.3), actions, effects and assumptions concerning loads for calculating components have been supplemented.
— In 5.10.1.4.1 (formerly 5.8.1.4.1), requirements for conveyor belt strength testing by manufacturers have been added. In addition, the breaking strength safety coefficient of the belt can be reduced to a certain value if the absence of risk to users is demonstrated.
— Subclause 5.10.1.4.2, explaining the strength requirements for pins and shafts, has been added.
— Subclause 5.10.1.4.3, explaining the strength requirements for tunnels, has been added.
— In 5.10.2.2 (formerly 5.8.2.2), the requirements for conveyor belt materials have been supplemented.
— Subclause 5.10.3, detailing the requirements for the presentation of the calculations and justifications mentioned in 5.10, has been added.
— Subclause 5.11, determining the requirements for the conditions of use of the travelator established between the customer and the manufacturer, has been added.
— In 6.1, all the technical documentation is listed.
— In 6.2, the verifications during the design/construction phase have been supplemented.
— In 6.3, the verifications of the installation site have been supplemented.
— In 7.2, the appropriate signage concerning passenger behaviour has been supplemented.
— In 7.3.1, the general requirements for the content of accompanying documents have been supplemented.
— In 7.3.2, the content of the assembly instructions has been supplemented.
— Subclause 7.3.2.2, providing specific information on conditions for the travelator installation, has been added.
— Subclause 7.3.2.3, providing specific information on ground conditions at the boarding and alighting areas has been added.
— Subclause 7.3.2.4, providing specific information on ground conditions along the route of a travelator, has been added.
— In 7.3.3.1 (formerly 7.3.3), the general requirements for the instructions for use with maintenance instructions have been supplemented.
— Subclause 7.3.3.2, providing specific information on periodic verification procedures, has been added.
— Subclause 7.3.3.3, detailing the requirements for direct and indirect monitoring of the travelator installation, has been added.
— Subclause 7.3.3.4, providing specific information on maintenance, has been added.
— Subclause 7.3.3.5, detailing night operation requirements, has been added.
— Subclause 7.3.3.6, detailing requirements for operating travelators with children under the age of 5 years, has been added.
— In 7.4, the marking requirements for travelators have been supplemented.
— Annex A (informative), explaining Subclause 4, has been added.
— Annex B (informative) explaining examples of the method for measuring the safety characteristics of travelators has been added.
— Annex C (informative), explaining Subclause 5.5.2.1.1, has been added.
— Annex D (informative) explaining a method for measuring the emergency stop distance when opening the safety flap of travelators has been added.
— Annex E (normative), explaining Subclause 5.11, has been added.
— Annex F (informative) (formerly Annex B) has been supplemented.
— Annex G (informative), explaining Subclause 7.3.3.2, has been added.

— Annex ZA has been updated.

This document has been prepared as part of a standardisation request made to CEN by the European Commission and the European Free Trade Association, and supports the essential requirements of the (EU) Directive(s)/Regulation(s).

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

The user should address any feedback or questions regarding this document to their country's national standards organisation. A comprehensive list of these organisations can be found on the CEN website.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are required to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, the Republic of North Macedonia, the Republic of Serbia, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

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

This document concerns, specifically, the following stakeholder groups representing market players in the field of safety of machinery:

— Machinery manufacturers;

— Health and safety bodies (regulatory authorities, occupational risk prevention bodies, market surveillance etc.).

Other partners that may be affected by the level of machinery safety achieved with the aid of the document by the aforementioned stakeholder groups include:

— Machinery users/employers;

— Machinery users/employees (e.g. trade unions, organisations representing people with special needs);

— Service providers, e.g. maintenance companies;

— Consumers (for machinery intended for use by consumers).

The aforementioned stakeholder groups were given the opportunity to participate in the development of this document.

The machines concerned and the range of hazardous phenomena, situations and events covered are indicated in the scope of this document.

If the requirements of this type C document differ from those mentioned in the type A or B standards, the requirements in this type C document prevail over the requirements in the other standards for machines that have been designed and manufactured in accordance with the requirements in this type C document.

1 Scope

This document applies to travelators, with or without tunnel, for tourist or winter sporting use.

These requirements concern travelators for transporting passengers (users and operators) on their snow-sliding devices or pedestrians wearing ski boots or heavy boots for winter sports activities. For other uses, passengers (users and operators) shall wear footwear that is suitable (closed-toe, robust shoes) for travelators. The standard provides that the travelator is used by children under the age of 5 only if they are accompanied or supervised.

This document addresses the automatic operation of these devices without an operator who is continuously present at the site of the equipment.

It includes requirements for the prevention of accidents and the protection of users and operators.

This document addresses all the significant hazardous phenomena and hazardous situations and events specific to travelators for tourist or winter sporting activities when they are used as intended and in cases of improper use that could be reasonably foreseen by the manufacturer (see Subclause 4).

This document does not apply to moving walks as specified in EN 115-1:2017 or to boarding bands as specified in EN 1907:2017.

This document does not apply to travelators manufactured before the date of its publication as a European Standard.

2 Normative references

The following documents referred to in the text constitute, for all or part of their content, requirements in this document. For dated references, only the cited edition applies. For undated references, the last edition of the reference document applies (including any amendments).

EN 115-1:2017, *Safety of escalators and moving walks — Part 1: Construction and installation*

EN 619:2002+A1:2010, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of unit loads*

EN 981:1996+A1:2008, *Safety of machinery — System of auditory and visual danger and information signals*

EN 1907:2017, *Safety requirements for cableway installations designed to carry persons — Terminology*

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

EN 1991-1-3:2003, *Eurocode 1 — Actions on structures — Part 1-3: General actions — Snow loads*

EN 1991-1-4:2005, *Eurocode 1: Actions on structures — Part 1-4: General actions — Wind actions*

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

EN 1993-1-9:2005, *Eurocode 3 — Design of steel structures — Part 1-9: Fatigue*

EN 12397:2017, *Safety requirements for cableway installations designed to carry persons — Operation*

EN 12930:2015, *Safety requirements for cableway installations designed to carry persons — Calculations*

EN 13501-1:2018, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 60204-1:2018, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

EN 60947-5-1:2017, *Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices*

EN 61496-1:2013, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests*

EN 61496-2:2013, *Safety of machinery — Electro-sensitive protective equipment — Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)*

EN 62061:2005, *Functional safety of safety-related electrical, electronic and programmable electronic control systems*

EN ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

EN ISO 7010:2020, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

EN ISO 7731:2008, *Ergonomics — Danger signals for public and work areas — Auditory danger signals*

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

EN ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

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

EN ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

EN ISO 14119:2013, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

EN ISO 14120:2015, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN ISO 14122-2:2016, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways*