



BSI Standards Publication

Comparison of worldwide escalator and moving walk safety standards

Part 1: Clause by clause comparison

National foreword

This British Standard is the UK implementation of ISO/TR 14799-1:2022. It supersedes PD ISO/TR 14799-1:2015, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MHE/4, Lifts, hoists and escalators.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Comparison of worldwide escalator and moving walk safety standards —

Part 1: Clause by clause comparison

*Comparaison des normes mondiales de sécurité des escaliers
mécaniques et trottoirs roulants —*

Partie 1: Comparaison paragraphe par paragraphe



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 178, *Lifts, escalators and moving walks*.

This third edition cancels and replaces the second edition (ISO/TR 14799-1:2015), which has been technically revised.

The main changes are as follows:

- Updated the content according to the latest revisions of EN 115-1, ASME A17.1/CSA B44 and Japanese Codes 2016;
- Added an explanation of the difference between this revision and the previous edition;
- Removed ASME A17.1/CSA B44 content, which is not included due to copyright issues (only the clause numbers are indicated).

A list of all parts in the ISO 14799 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document is a result of work by ISO/TC 178 on a comparison of worldwide standards on escalators and moving walk safety including standards from Australia, Europe, Japan, Russia and the US. In 1995, ISO/TC 178 was tasked with preparing a cross-reference document with the relevant sections of each standard and an analysis of the differences. The goal at that time was to prepare a Technical Report which would provide reference information to assist national committees when reviewing and revising individual standards which can initiate a gradual convergence of the technical requirements. In 1996, the study was expanded to include the Korean safety standard.

This document is intended to aid standards writers in developing their safety requirements and to help standards users understand the basis for the requirements as they are applied throughout the world.

EN 115-1 is used as a reference document and its clauses are shown in their normal sequence. The other reference documents (ASME A.17/B.44.1 and Japanese Codes) are not in their normal sequence and logical order. They are structured differently to EN 115-1. The result is that can appear in [Table 1](#) that these standards are incomplete. These standards in their original structure inclusive of their references to other standards and requirements are, however, complete.

This comparison no longer includes the Australian, Korean, and Russian safety codes as there are intentions on the national level to bring these codes in line with one of the remaining three codes.

Due to copyright restrictions, the content of ASME A.17/B.44.1 is not included in the comparison table ([Table 1](#)). Only reference to the clauses in ASME A.17/B.44.1 are included.

The graphical symbols shown in the following figures from EN 115-1:2017 are not included in this document, as they are not registered as official ISO graphical symbols:

- Figure 1.2
- Figure G.1
- Figure G.2
- Figure G.3
- Figure G.4

Comparison of worldwide escalator and moving walk safety standards —

Part 1: Clause by clause comparison

1 Scope

This document compares the requirements of selected clauses of the following standards (excluding local deviations):

- a) EN 115-1:2017 ^[12];
- b) ASME A17.1/CSA B44-2016 ^[11];
- c) Japanese Codes 2016 ^[13].

NOTE The original Japanese codes were written in Japanese and no official English versions have been released. Listed Japanese codes were carefully translated, but English correspondence to the original document is not guaranteed.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Clause by clause comparison

4.1 General

[Table 1](#) compares the content of EN 115 1 (European), ASME A17.1/B44 (North American) and the Japanese codes, clause by clause. There are other standards in the countries concerned that have requirements not shown in the escalator/moving walk standards compared, but which address some of the same requirements as EN 115-1.

The principal dimensions (e.g. L1, b8, h6) in EN 115-1 can be seen in the figures shown in EN 115-1:2017, 2.2, ASME A17.1/B44-2016, 2.3 and Japanese Codes 2016, 2.4.

Table 1 — Comparison of EN 115-1, ASME 17.1/CSA B44 and Japanese codes 2016

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
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).	1.1/1.2	No equivalent statement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
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.		

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
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. No equivalent requirement.	No equivalent requirement.	
		BSLJ-EO (Fundamental Principles of Structural Design) Article 36-2 In planning the structural design of buildings, columns, beams, floors, walls, etc., shall be arranged effectively according to use, scale, and structural features of the building concerned, as well as the conditions of the land concerned, so that the said building, as a whole, will be of structure safe from dead load, live load, snow load, wind pressure, ground pressure, and water pressure, as well as earthquakes or other vibration or shock acting upon the said building. 2. Principal parts necessary for structural strength shall be arranged in balance so as to resist any horizontal forces acting upon the building concerned. 3 Principal parts of a building necessary for structural strength shall be designed to have rigidity enough to prevent distortion or vibration adversely affecting the use of the said building and toughness enough to prevent sudden destruction.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
No equivalent requirement.	No equivalent requirement.	BSLJ (Maintenance) Article 8-1 The owner, custodian, or occupant of a building shall endeavour to maintain the site, structure, and building equipment of the building in a state complying with legal requirements.
No equivalent requirement.	No equivalent requirement.	BSLJ (Reports, Inspection, etc.) Article 12-2 The owners of elevatory equipment and those of building equipment other than elevatory equipment (including building equipment installed in buildings of the State, a prefecture, or a city, town, or village having building officers) of a building as mentioned in article 6, paragraph 1, item (1), or any other building specified by cabinet order as mentioned in the preceding paragraph and designated by the special administrative agency, shall, in accordance with Ministry of Construction Order, have a 1st-class licensed architect/building engineer, a 2nd-class licensed architect/building engineer, or a qualified person as designated by the Ministry of Construction periodically inspect the said building equipment, and report the inspection results to the special administrative agency.
No equivalent requirement.	Page xxi shows the way to demonstrate compliance for new technologies	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Introduction - continued 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 ISO 14798 by the building designer/owner at the building design stage and measures identified to 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.	6.1.8.1/6.2.8.16.1.8.1.1/6.2.8.1.1 6.1.8.1.2/6.2.8.1.2 6.1.8.2/6.2.8.2 6.1.8.2.1/6.2.8.2.1 6.1.8.2.2/6.2.8.2.26.1.8.3/6.2.8.3	JEAS-520A (2010) Installation for outdoor condition 3.1 Building planning consideration 3.1.1 Installation of roof In outdoor environments, the step surface is slippery at the time of rain and snow, and the user's posture tends to be unstable. On the management side, it is necessary to install a roof on the escalator in order to prolong the life of the equipment and maintain safe operation. 3.1.2 Invasion and drainage of rainwater etc. 1. In order to prevent rain or snow from entering the escalator, At the landing, it is higher than the surrounding floor surface and a gradient and a drain groove are provided. 2. A facility capable of draining the accumulated water is provided in the lower pit of the escalator.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
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.		Because there is contamination of oil and dust in the drainage, a filtration facility is installed in the external drain outlet to facilitate the removal of contaminants. It is necessary that measures shall be applied to prevent reverse flow of wastewater. 3.1.3 Installation of monitoring board, TV camera etc. for management. In case of trouble in operation and management, it shall be install the monitoring board and/or camera. 3.1.4 Thermal insulation Depending on the installation environment, a thermal insulation device etc. shall be provided to prevent failure due to freezing of equipment. 3.1.5 Others 1. In consideration of night time use, it shall be provided the lighting equipment where the user can see the feet 2. It shall be applied the waterproof measures at the escalator's power inlet. 3.2 Management consideration The escalators installed in outdoor environments need the following consideration for operation management. 3.2.1 When the wind and rain blows into the escalator, it shall be stopped the operation of the escalator to prevent the user from falling. 3.2.2 When snowfall or freezing in winter, it shall be stopped the operation of the escalator to prevent the user from falling or damage the equipment. 3.2.3 When escalator is out of service, the measures shall be taken that will not be used instead of stairs.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Remark: European foreword e) clarification of the text and incorporation of proposals resulting from interpretation requests 1); 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		3.2.4 Because the usage conditions are severe than in indoor environments, escalators installed under outdoor environments need to be maintained and inspected according to the installation environment. 3.3 Equipments consideration The escalators installed in outdoor environments need the following consideration for the equipments management. 3.3.1 It shall be applied the appropriate anti-rust measures to the main structure. 3.3.2 It shall be applied the waterproof measures at the electrical equipments
Page xxiii is describing the method of managing interpretations		The Interpretation Committee corresponding to each law or standard is different.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
1 Scope 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).	1.1.1	BSLJ-EO (Structure of escalator) Article 129-3 The provisions of this section shall apply to the elevatory equipment installed in buildings and described in each of the following items. 1. (2) Escalator Notwithstanding the provision of the preceding paragraph, the provisions of each said item shall not apply to the elevatory equipment described in following each item. 2. (2) The escalators of special construction and special use form of which structural method designated by the minister of land, infrastructure, and transport; the provisions of BSLJ-EO; Article 129-12, paragraph 1.
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.	No equivalent requirement.	BSLJ (Exclusion of application) Article 3 The provision of the preceding paragraph shall not apply to building, sites of building, or the parts of buildings or sites thereof coming under any of the following items: 3. (3) Building or sites thereof whose construction work for addition, rebuilding, major repair, or major remodelling is started after the enforcement or application of the provisions of this Law or those of orders or ordinances based thereon EXP.3.(3) In case of addition to a building, modification of a building, change of location, major renovation or change of layout, the current law shall be applied. The part which does not comply with the law, shall be modified to comply with the law.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
No equivalent requirement.	1.1.3 1.3	BSLJ (Exclusion of application) Article 3 The provision of the preceding paragraph shall not apply to building, sites of building, or the parts of buildings or sites thereof coming under any of the following items: 2. In cases where buildings or sites thereof which are actually existing or under construction, repair or remodeling at the time of the enforcement or application of the provisions of this Law or those of orders or ordinances based thereon, do not conform to those provisions or have unconformable parts, the said provisions shall not apply to such buildings, sites of buildings, or the parts of such buildings or sites thereof.
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.	Part 9	No equivalent requirement.
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.	1.3	No equivalent requirement.
3.1.1 angle of inclination maximum angle to the horizontal in which the steps, the pallets or the belt move.	6.1.3.1	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
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).	1.3	No equivalent requirement.
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.	6.1.3.3 (see Non-mandatory Appendix I, Fig. I.3) 6.2.3.3 (see Non-mandatory Appendix I, Fig. I-9)	No equivalent requirement.
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.	1.3	No equivalent requirement.
3.1.5 brake load load on the step/pallet/belt which the brake system is designed to stop the escalator/moving walk.	6.1.3.9.3	No equivalent requirement.
3.1.6 comb prolonged section at each landing that meshes with the grooves.	1.3	No equivalent requirement.
3.1.7 comb plate platform at each landing to which the combs are attached.	1.3	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
3.1.8 competent person a person which is in possession of the necessary technical knowledge, skills, qualification and experience to perform a work or task Note 1 to entry: National Regulation may require certification of competence	1.3	No equivalent requirement.
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.	1.3	BSLJ-EO (Scope of application) Article 129-3, EXP. 1.(2) The escalator means "power driven, continuous stairway or walkway for the transport of passengers".
3.1.10 exterior panel part of the exterior side of the enclosure of an escalator or moving walk.	1.3	No equivalent requirement.
3.1.11 failsafe circuit safety related electrical and/or electronic system with defined failure mode behaviour.	1.3	No equivalent requirement.
3.1.12 handrail power-driven moving rail for persons to grip while using the escalator or moving walk.	No equivalent requirements.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
3.1.13 interior panel panel located between the skirting or lower inner decking and the handrail guidance profile or balustrade decking.	1.3	No equivalent requirement.
3.1.14 lower inner decking profile that connects the skirting with the interior panel when they do not meet at a common point.	1.3	No equivalent requirement.
3.1.15 lower outer decking profile that connects the exterior panels with the interior panel.	1.3	No equivalent requirement.
3.1.16 machinery escalator or moving walk machine(s) mechanisms and associated equipment.	1.3	No equivalent requirement.
3.1.17 machinery spaces space(s) inside or outside of the truss where the machinery as a whole or in parts is placed.	No equivalent requirement.	No equivalent requirement.
3.1.18 maximum capacity maximum flow of persons that can be achieved under operational conditions.	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
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.	1.3	BSLJ-EO (Scope of application) Article 129-3, EXP. 1.(2) The walkway (called passenger conveyor) means that the angle of inclination is equal to or less than 15° and the tread surface of pallets or belts, which the height difference between pallets is equal to or less than 4 mm, is horizontal or inclined.
3.1.20 newel End of balustrade.	1.3	No equivalent requirement.
3.1.21 nominal speed speed in the direction of the moving steps, pallets or the belt stated by the manufacturer for which the escalator or moving walk has been designed, without load on the steps/pallets/belt at nominal frequency and nominal voltage.	1.3	BSLJ-EO (Structure of escalator) Article 129-12, EXP. 1.(5) Rated speed: Speed in the up direction of the moving steps, pallets, or the belt when operating the equipment under no load condition.
3.1.22 rise vertical distance between the upper and lower finished floor levels.	1.3	No equivalent requirement.
3.1.23 safety circuit part of the electric safety system consisting of electrical safety devices.	No equivalent requirement.	No equivalent requirement.
3.1.24 safety devices part of a safety circuit consisting of safety switches and/or failsafe circuits.	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
3.1.25 safety integrity level SIL discrete level for specifying the safety integrity requirements of the safety functions to be allocated to the E/E/PE. Note 1 to entry: In this European Standard SIL 1 is representing the lowest level and SIL 3 the highest, even when it does not make use of SIL 3.	1.3	No equivalent requirement.
3.1.26 safety related electrical, electronic and programmable electronic devices, E/E/PE system for control, protection or monitoring based on one or more electrical, electronic or programmable electronic devices, including all elements of the system such as power supplies, sensors and other input devices, data highways and other communication paths, and actuators and other output devices, used in safety related applications as listed in Table 8 and Table 9.	1.3	No equivalent requirement.
3.1.27 safety system safety related part of the electrical control system as an arrangement of safety circuits and monitoring devices.	No equivalent requirement.	No equivalent requirement.
3.1.28 skirting vertical part of the balustrade interfacing with the steps, pallets or belt.	1.3	No equivalent requirement.
3.1.29 skirt deflector device to minimize the risk of trapping between the step and the skirting.	No equivalent requirements.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
3.1.30 structural rated load load which the structure is designed for.	No equivalent requirement.	No equivalent requirement.
3.2 Symbols and abbreviations See Table 1.	Note - A17.1 have additional definitions with no equivalent in EN 115-1 and JIS No equivalent requirements.	No equivalent requirement.
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 assessment as significant for escalators and moving walks and which require action to eliminate or reduce the risk. These significant hazards are based upon EN ISO 12100:2010.	No equivalent requirement.	No equivalent requirement.
4.2 Mechanical hazards Mechanical hazards on escalators and moving walks and in their immediate vicinity can occur because of the design of the machine or access to it. These include: — contact with moving machinery parts (e.g. driving unit, handrail drive) normally not accessible to the public (see 5.2.1.1, 5.2.1.2, 5.2.1.3, 5.2.1.5, 5.2.1.6, 5.2.3, 5.2.4, 5.8.1, 5.8.4, 5.12.3.13, A.3.2, A.3.3); — crushing and shearing of fingers between handrail and balustrade and between balustrades (see 5.5.2.5, 5.6.2); cutting hazard caused by adjacent cover profile parts (see 5.5.2.4);	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— impact on bodies caused by collision with building structures (wall, roof, criss-cross arrangement), or with persons on adjacent escalators/moving walks (see A.2.1, A.2.2, A.2.3, A.2.4); — drawing-in at handrail entry into the balustrade (see 5.6.4.3, 5.6.5); — trapping between skirting and steps, between comb and step/pallet (see 5.3.4, 5.3.5, 5.5.3, 5.5.5, 5.7.2.5, 5.7.3, Fig. G.2); — trapping between the floor/fixed devices and the handrail (see 5.6.4.1, 5.6.4.2, A.5); — trapping between step and step or pallet and pallet (see 5.3.2).		
4.3 Electric hazards Electric hazardous situations can occur due to: — contact of persons with live parts (see 5.8.3.3, 5.11.1.3); — indirect contact (see 5.11.1.4, A.6); — inadequate emergency stops (see 5.12.3.8); — wrong assembly of electric components (see 5.11.4.4); — electrostatic phenomena (see 5.12.1.5); — external influences on electric equipment (see 5.12.2.4, 5.12.2.6.1.3).	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
4.4 Radiation hazards 4.4.1 Electromagnetic radiation generated by the machine Electromagnetic radiation can be emitted by the escalator or moving walk during normal operation (see 5.11.1.2.3, 5.12.2.4).	No equivalent requirement.	No equivalent requirement.
4.4.2 Electromagnetic radiation received from outside Electromagnetic radiation, like low frequency radiation, radio frequency radiation and microwaves, can be received by the escalator or moving walk during normal operation (see 5.11.1.2.3, 5.12.2.4).	No equivalent requirement.	No equivalent requirement.
4.5 Fire hazard Fire hazards can be generated by accumulation of combustible material inside the truss, by the insulation material for cables and overloading of drives (see 5.2.1.4, 5.9).	No equivalent requirement.	No equivalent requirement.
4.6 Hazards generated by neglecting ergonomic principles in machinery design Hazardous situation can occur because of: — neglecting ergonomic dimensions for the users (e.g. height of balustrade, width of handrail) (see 5.5.2.1, 5.6.2, 5.6.3); — inadequate lighting in the working places and access to them (see 5.8.3.1, 5.8.3.2, A.3.3, A.3.4); — insufficient space in working places (see 5.8.2.1, 5.8.2.2, 5.8.2.3, A.3.5, A.3.6, A.3.7); — missing lifting equipment for heavy loads (see 5.8.2.2, 5.10).	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
4.7 Hazard generated by failure of control circuit Hazardous situation can occur because of: — no stopping in case of dangerous situations (see 5.11.2, 5.12.1.2); — short circuit of electric wiring (see 5.11.1.4, 5.11.1.6, 5.11.4); — overload of electric wiring (see 5.12.1.3, 5.11.4, 5.12.1.2, 5.12.3); — unexpected start of machine after an interruption (see 5.12.3, 5.12.3.5.1); — unexpected reversal of drive (see 5.4.2.3, 5.12.1.2); — excessive speed (see 5.4.2.3, 5.12.1.2); — excessive deceleration during stopping (see 5.12.1.2).	No equivalent requirement.	No equivalent requirement.
4.8 Hazards generated by break-up during operation Even if the design of an escalator or moving walks follows the requirements of EN 115-1, there are specific hazards which can occur due to — greater than specified user and structural loads on the truss (see 5.2.5); — loads greater than specified onto the balustrade (see 5.2.3, 5.5.2.4); — loads greater than specified on the steps/pallets by unforeseeable misuse (see 5.3.3); — loads greater than specified on the drive unit (see 5.4.1.3, 5.4.3, 5.4.4).	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
4.9 Slipping, tripping and falling hazards Most of the dangerous situations on escalators and moving walks are caused by the slipping and falling of persons. These include: — slipping on steps/pallets/belt, on the comb plate and floor plate (see 5.3.1, 5.5.4, 5.7.1); — falling caused by handrail speed deviation (incl. standstill) (see 5.6.1, Fig. G.1, Fig. G.3); — falling caused by change of the direction of movement (see 5.4.2.3); — falling caused by increased acceleration/deceleration (see 5.2.2, 5.4.1.1, 5.4.1.2, 5.4.2.1, 5.4.2.2, 5.7.2.1, 5.7.2.2, 5.7.2.3, 5.7.2.4); — falling caused by unexpected start/stopping or excessive speed of the machine (see 5.12.3.5.1); — falling caused by inadequate lighting at the landings (see A.2.8, A.2.9).	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
4.10 Hazards specific for this type of machine Many hazards are specific for that type of machine. These include: — missing steps or pallets (see 5.3.6); — trapping by hand winding device (see 5.4.1.4); — misuse by transporting other items than persons (e.g. shopping or luggage trolleys, push chairs) (see 7.4.1 d), A.4, Fig. G.4, Annex I); — climbing on the outside of the balustrade (see 5.5.2.2); — sliding between balustrades (see 5.5.2.2); — climbing over the balustrade (see 5.5.2.6); — surfing on the handrail (see 5.5.2.2); — storage of merchandise adjacent to the balustrade (see 7.4.1 d)); — creation of traffic jam at blocked landings or intermediate exits of consecutive escalators or moving walks (see A.2.5, A.2.6); — disturbance of the person flow in connected escalators/moving walks (see A.2.5, A.2.6); — lifting by the handrail at the newel ends and falling over adjacent fixed barrier or the balustrade of the escalator/moving walk (see A.2.7). NOTE For the actual type of machinery, noise is not considered as a significant nor relevant hazard.	No equivalent requirement.	No equivalent requirement.
4.11 Significant hazards due to seismic events — Damage to equipment (see M.2, M.3, M.5); — Crushing by displacement of equipment (see M.4).	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5 Safety requirements and/or protective/risk reduction measures 5.1 General Escalators and moving walks shall comply with the safety requirements and/or protective/risk reduction measures of this clause. In addition, escalators and moving walks shall be designed according to the principles of EN ISO 12100:2010, 6.2, for relevant but not significant hazards, which are not dealt with by this standard. Certain escalators and moving walks are subject to special operational and environmental conditions. For these cases some additional recommendations are defined (see H.2 and Annex M).	No equivalent requirement.	No equivalent requirement.
5.2 Supporting structure (truss) and enclosure 5.2.1 General 5.2.1.1 All mechanically moving parts of the escalator or moving walk shall be completely enclosed within imperforate 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. Apertures for ventilation are permitted (see also 5.2.1.5).	6.1.2/ 6.2.2	No equivalent requirement.
No equivalent requirement.	6.1.3.3.1/6.2.3.3.1 (b) (1) (2) 6.1.1 6.1.2	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.2.1.2 Any gaps or openings are restricted to 4 mm where there is a risk of contact with moving parts. The exterior panels shall withstand a force of 250 N at any point at right angles on a round or square area of 2 500 mm ² without breakage. The fixing shall be designed in that way to carry at least twice the dead load of the enclosure.	Defined in building codes.	No equivalent requirement.
5.2.1.3 It is permissible to omit an enclosure of the mechanically moved parts if other measures (such as rooms with locked doors accessible to authorized personnel only) make a hazard to the public impossible.	No equivalent requirement.	No equivalent requirement.
5.2.1.4 Accumulation of materials (e.g. grease, oil, dust, paper) represents a fire risk. Therefore, it shall be possible to clean the inner part of the escalator/moving walk.	8.6.8.13/8.6.9.11	No equivalent requirement.
5.2.1.5 Ventilation apertures shall be built or arranged in such a way to comply with EN ISO 13857:2008, Table 5. However, it shall not be possible to pass a straight rigid rod 10 mm in diameter through the enclosure and to touch any moving part through a ventilation aperture.	6.1.2/ 6.2.2	No equivalent requirement.
5.2.1.6 Any exterior panels which are designed to be opened (e.g. for cleaning purposes) shall be provided with a safety device according to 5.12.2.7.14.	6.1.7.3.3/6.2.7.3.3	No equivalent requirement.
5.2.2 Angle of inclination The angle of inclination α of the escalator shall not exceed 30°, but for rises $h \geq 13$ not exceeding 6 m and a nominal speed not exceeding 0,50 m/s the angle of inclination is permitted to be increased up to 35° (see α in Figure 5). The angle of inclination of moving walks shall not exceed 12°.	6.1.3 6.1.3.1 6.2.3.1	BSLJ-EO (Structure of escalator) Article 129-12, EXP. 1.(2) The inclination (slope) of the escalator shall be 30° or less. However, the inclination of 35° or less is permitted for the escalator as provided to MOC-N (No.1413-2000) 2.(1). The inclination of 15° or less is permitted for the moving walks as provided to MOC-N (No.1417-2000)2.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
No equivalent requirement.	No equivalent requirement.	MOC-N (No.1413-2000) 2. The escalators of the special construction or the special use form to which the provisions described in the BSLJ-EO; Article 129-3, item 3, paragraph 2 are not applied shall conform to the construction method specified in each paragraph come under the kind of the escalators described in following each paragraph. (1) The escalator of which inclination exceeding 30°. In addition to conforming to the provisions stipulated in BSLJ-EO; Article 129-12, item 1, paragraph 1, 3, and 4, it shall conform to the construction specified as follows. (a) It shall be that the inclination is less than 35°. (2) The escalator of which step tread width exceeding 1,1 m. In addition to conforming to the provisions stipulated in BSLJ-EO; Article 129-12, item 1, paragraph 1, 3, and 4, it shall conform to the construction specified as follows. (a) It shall be that the inclination is less than 4°. (3) The escalator of which speed varies in halfway of travel. It shall conform to the construction specified as follows. (e) Slope of the escalator shall be equal to or less than 4° at the position where the speed of step varies and shall be equal to or less than 8° at the position other than the part mentioned above.
5.2.3 Access to the interior Machinery spaces inside the truss shall only be accessible to authorized persons (e.g. by key, access control).	8.1.3	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.2.4 Inspection covers Inspection covers shall be provided with a safety device according to 5.12.2.7.14. It shall only be possible to open inspection covers by a key or a tool suited for that purpose. Parts of the balustrade (e.g. deckings, panels) which are required to be removed for maintenance purposes shall not be considered to be inspection covers. If the inspection cover consists of more than one part, one safety device shall be provided on the one to be opened first. For the consecutive ones either removal shall be prevented, e.g. by mechanical interlocking, overlapping or each single part shall be provided with a safety device. If rooms behind inspection covers can be entered, it shall be possible to open them from the inside without a key or a tool even when locked. Inspection covers shall be imperforate. Inspection covers shall conform to the same conditions as required for the location (e.g. the balustrade, the cladding, the floor plate) where they are installed. NOTE Floor plates can have the functionality of an inspection cover. In this case the same conditions for inspection covers apply.	6.1.7.3/6.2.7.3 6.1.7.3.2 6.1.7.3.3 6.1.7.3.1/6.2.7.3.1	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.2.5 Structural design The supporting structure shall be designed in a way that it can support the dead weight of the escalator or moving walk plus a structural rated load of 5 000 N/m². It shall be calculated in accordance with EN 1993-1-1:2005. NOTE Load carrying area = (nominal width z_1 (see Figure 4) of the escalator or moving walk) x (distance l_1 between the supports) (see Figure 5). Based on the structural rated load, the maximum calculated or measured deflection shall not exceed 1/750 of the distance l_1 between the supports. Based on the structural rated load for the comb plate and floor plate the maximum deflection shall not exceed 4 mm and the meshing of the combs shall be ensured.	6.1.3.9/6.2.3.10 6.1.3.9.1 6.2.3.10.1	BSLJ-EO (Structure of escalator) Article 129-12 3. Carrying load for the escalators shall equal or exceed the values calculated by the following formula: $P = 2\,600\text{ A N/m}^2$ where: P is the carrying load for the escalator, in Newton; A is the horizontal projected area of the steps of the escalators, in square meters. MOC-N (No.1418-2000) 1. α_1 stipulated in BSLJ-EO; Article129-4, item 2 paragraph 2 applied Article129-12, item 2, is 1.0 and α_2 stipulated in the same enforcement order is 1.5. [see 2.4.2 Table 2] 2. The escalator strength verification method shall conform to the following each item. (2) In the BSLJ-EO; Article129-12, item 2, the safety factor of step, frame, and truss or beam stipulated in BSLJ-EO; Article 129-4, item 2, paragraph 3 of the Building Standard Law Enforcement Order applied mutatis mutandis shall be not less than the value described in the following table. [see 2.4.2 Table 3] b. Truss or beam JEAS-A1003 (2014) Escalator specifications. JEAS-1004B (2002) Structural calculation for escalator.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
No equivalent requirement.	6.2.3.9 6.2.3.9.1 (b) (1) (2) (d)	No equivalent requirement.
No equivalent requirement.	6.1.3.7	No equivalent requirement.
5.3 Steps, pallets, belt 5.3.1 General In the user carrying area of the escalator, the step treads shall be horizontal with a tolerance of $\pm 1^\circ$ in the direction of travel. NOTE 1 The maximum permissible height between two consecutive steps at the landings is defined in 5.3.4 and 5.7.2.1. Tread surfaces for escalators and moving walks shall provide a secure foothold. NOTE 2 For definition of materials and test methods, see Annex J.	6.1.3.5.1 (c) 6.2.3.5.5 (c) 6.2.3.5.3	No equivalent requirement.
No equivalent requirement.	6.1.3.5.1/6.2.3.5.5 a), b)	No equivalent requirement.
No equivalent requirement.	6.1.3.5.8/6.2.3.5.6	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.3.2 Dimensions 5.3.2.1 General For escalators and moving walks the nominal width w_1 shall be not less than 0,58 m and not exceed 1,10 m. For moving walks with an angle of inclination up to 6° widths up to 1,65 m are permitted.	6.1.3.5.2 (also see Non-mandatory Appendix I, Fig I-7) 6.2.3.7 (also see Table 6.2.3.7)	BSLJ-EO (Structure of escalator) Article 129-12 1.(4) The width of the steps shall be not more than 1,1 m and the horizontal distance between the side edge of the steps and centre of the handrail at the same side of the steps shall be not more than 25 cm. MOC-N (No.1413-2000) [see 2.4.1 Fig.3] 2. The escalators of the special construction or the special use form to which the provisions described in the BSLJ-EO; Article 129-3, item 3, paragraph 2 are not applied shall conform to the construction method specified in each paragraph come under the kind of the escalators described in following each paragraph. 2.(2) The escalator of which step tread width exceeding 1,1 m. In addition to conforming to the provisions stipulated in the BSLJ-EO; Article 129-12, item 1, paragraph 1, 3, and 4, it shall conform to the construction specified as follows. (c) It shall be that the width of the step is less than 1,6 m and the horizontal distance between the said edge of the step and centre of the handrail of the said side of the step is less than 25 cm. 2. (3) The escalator of which speed varies in half-way of travel. It shall conform to the construction specified as follows. (f) Width of a step shall be equal to or less than 1,6 m. Horizontal displacement between the side of a step and the centre of an upper surface of handrail on the same side of the said step shall be equal to or less than 25 cm.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.3.2.2 Step treads and pallets (see Figure 5, detail X and Figure 8). 5.3.2.2.1 The step height x_1 shall not exceed 0,24 m. 5.3.2.2.2 The step depth y_1 shall be not less than 0,38 m.	6.1.3.5.2 (also see Non-mandatory Appendix I, Fig I-7)	MOC-N (No.1413-2000) 2. The escalators of the special construction or the special use form to which the provisions described in the BSLJ-EO; Article 129-3, item 3, paragraph 2 are not applied shall conform to the construction method specified in each paragraph come under the kind of the escalators described in following each paragraph (1) The escalator of which inclination exceeding 30°. In addition to conforming to the provisions stipulated in the BSLJ-EO; Article 129-12, item 1, paragraph 1, 3, and 4, it shall conform to the construction specified as follows. (d) It shall be that the depth of the step is more than 35 cm [see 2.4.1 Figure 1]
5.3.2.2.3 The surface of the step treads and pallets shall have grooves in the direction of movement with which the teeth of the combs mesh.	6.1.3.5.5/6.2.3.5.1	No equivalent requirement.
5.3.2.2.4 The step risers shall be cleated and the surface of the cleat shall be smooth. The ends of the step tread shall mesh with the cleating of the next step riser.	6.1.3.5.3 (also see Non-mandatory Appendix I, Fig. I-8)	No equivalent requirement.
5.3.2.2.5 The width b_7 of the grooves shall be at least 5 mm and not exceed 7 mm.	6.1.3.5.5	No equivalent requirement.
5.3.2.2.6 The depth h_7 of the grooves shall be not less than 10 mm.	6.2.3.5.1 (see Non-mandatory Appendix I, Fig. I-10).	
5.3.2.2.7 The web width b_8 shall be at least 2,5 mm and not exceed 5 mm.		
5.3.2.2.8 The step treads and step risers or pallets shall not finish with a groove at their side edges.	6.1.3.5.5 (also see Non-mandatory Appendix I, Fig. I-7) 6.2.3.5.1 (see Non-mandatory Appendix I, Fig. I-10).	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.3.2.2.9 The edge between the surface of the step tread and the riser shall have any sharpness relieved.	No equivalent requirements.	No equivalent requirement.
5.3.2.3 Belts (see Figure 5, detail X)	6.2.3.6.2	No equivalent requirement.
5.3.2.3.1 The belts shall have grooves in the direction of travel with which the teeth of the comb mesh.		
5.3.2.3.2 The width b_7 of the grooves shall be at least 4,5 mm and not exceed 7 mm, and shall be measured at the tread surface of the belt.		
5.3.2.3.3 The depth h_7 of the grooves shall be not less than 5 mm.		
5.3.2.3.4 The web width b_8 shall be at least 4,5 mm and not exceed 8 mm and shall be measured at the tread surface of the belt.		
5.3.2.3.5 The belt shall not finish with a groove at the side edge of the belt.	6.2.3.6.2	No equivalent requirement.
Splicing of the treadmill belt shall be such as to provide a continuous unbroken treadmill surface.	6.2.3.6.1	
5.3.3 Structural design	6.1.3.9.4	(Same text as in the row related to EN 115-1, 5.2.5 applies also for step and frame in MOC-N (No. 1418-2000), 2. (2)(a))
5.3.3.1 General	6.1.3.10.4	JEAS-209 (2015)
The materials shall retain their strength characteristics during their specified life cycle taking into account the environmental conditions, e.g. temperature, ultraviolet radiation, humidity, corrosion.	6.2.3.10.4	Standard of the escalator structure necessary for the maintenance and inspection.
The steps, pallets and the belt shall be designed to withstand all possible loading and distortion effects, which may be imposed by the tracking, guiding and driving system during normal operation and shall be designed to support an equally distributed load corresponding to 6 000 N/m ² .	6.2.3.11.4	3.3.1 The weight of step (pallet) and floor plate shall be 30kg or less. JEAS-A1003 (2014) Escalator specifications.
NOTE 6 000 N/ m ² is derived from a structural rated load of 5 000 N/m ² (see 5.2.5) plus an impact factor of 1,2.		JEAS-1004B (2002) Structural calculation for escalator.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
To establish the dimensions of the belt and its supporting system, an area of effective width x 1,0 m length shall be taken as a basis for this corresponding load (in addition the requirements of 5.3.3.2.4 shall be complied with). Assembled steps and pallets shall be designed such that all component parts e.g. inserts or a are securely attached and do not become loose during their life cycle. The inserts and fixings shall withstand the reaction force of operating the comb/comb plate safety device (5.12.2.7.7).		
5.3.3.2 Static test 5.3.3.2.1 Steps The step shall be tested for deflection with a single force of 3 000 N (including weight of the plate) applied perpendicular to the tread surface on a steel plate 0,20 m x 0,30 m in size and at least 25 mm thick, in the centre of the tread surface. The edge of the plate being 0,20 m long shall be arranged parallel to the front edge of the step, the edge of the plate being 0,30 m long at right angles to the front edge of the step. During this test, the deflection measured at the tread surface shall be not more than 4 mm. There shall be no permanent deformation (initial setting tolerances are permitted). The step shall be tested as a whole together with rollers (not rotating), axles or stub shafts (if existing) in a horizontal position (horizontal support) and at the maximum inclination (inclined support) for which the step shall be applied. For all inclinations smaller than the maximum inclination permitted, a new test is not required. A test of the installed step, i.e. together with the guide rails and the supporting structure of the escalator, is also not necessary.	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
The tread surface on the side of the skirting shall not deflect in any position by more than 4 mm, when subjected to a single load of 1 500 N applied perpendicular to the tread surface at the beginning, on an area of 2 500 mm², using a square steel plate, minimum thickness 25 mm See Figure 1. In case of inserts/fixings on the tread surface the load shall be applied only on the insert/fixings itself, when assembled to the step. The area of the load shall be 50 mm by the width of the insert/fixings. See Figure 2. The applied force should be fixed vertically. The direction of the applied force shall not change during the test. There shall be no permanent deformation.		
5.3.3.2.2 Step riser The riser shall not deflect by more than 4 mm, when subjected to a single load of 1 500 N applied perpendicular to the surface at the beginning, on an area of 2 500 mm², using a square or round steel plate, minimum thickness 25 mm, shaped to fit the riser's curvature. This load shall be applied in the middle of the full height of the step riser in three positions across its width in the middle and at both ends of a fully assembled step. The applied force should be fixed, and the direction of the applied force shall not change during the test. The step shall be tested in a fixed position with axles or stub shafts (if existing). There shall be no permanent deformation (initial setting tolerances are permitted). In case of inserts/fixings on a step riser an additional test shall be undertaken on a fully assembled step with a load applied on the riser insert/fixings, in the middle of the full height of the step riser, to an area of 50 mm by the width of the insert/fixings. See Figure 2.	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.3.3.2.3 Pallets The pallet shall be tested for deflection with a single force which, for a pallet area of 1 m², shall be 7 500 N (including weight of the plate). The force shall be applied perpendicular to the tread surface on a steel plate 0,30 m x 0,45 m in size and at least 25 mm thick, in the centre of the tread surface, and the edge of the plate being 0,45 m long shall be arranged parallel to the lateral edge of the pallet. For pallets with smaller or larger areas, the force and the loading area shall be changed proportionally, whereby for the loading area the ratio of edge length shall be 1:1,5; however, the force shall be not below 3 000 N (including weight of the plate), the size of the plate be not smaller than 0,20 m x 0,30 m and its thickness be not less than 25 mm. For pallets with a depth smaller than 0,30 m the plate width shall be 0,20 m and the length of the plate shall be the depth of the pallet. During this test the deflection measured at the tread surface shall be not more than 4 mm. There shall be no permanent deformation (initial setting tolerances are permitted). The pallet shall be tested as a whole together with rollers (not rotating), axles or stub shafts (if existing) in a horizontal position. A test of the installed pallet, i.e. together with the guide rails and the supporting structure of the moving walk, is not required.	No equivalent requirement.	No equivalent requirement.

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.3.3.3.2.4 Belts With the belt tensioned to suit operational conditions, a single force of 750 N (including weight of the plate) shall be applied on a steel plate 0,15 m x 0,25 m x 0,025 m in size. The plate shall be placed centrally between the edge supporting rollers in such a way that its longitudinal axis is parallel to the longitudinal axis of the belt. The deflection at the centre shall not exceed 0,01 z3 where z3 is the transverse distance between the supporting rollers (see z3 in Figure 11).	6.2.3.9 (c) (1)	No equivalent requirement.
5.3.3.3 Dynamic tests 5.3.3.3.1 Steps 5.3.3.3.1.1 Load test The step shall be tested at the maximum inclination (inclined support) for which it shall be applied, together with rollers (not rotating), axles or stub shafts (if existing). It shall be subjected to a load pulsating between 500 N and 3 000 N at one frequency between 5 Hz and 20 Hz for at least 5×10^6 cycles whereby an undisturbed sinusoidal force flow shall be achieved. The load shall be applied perpendicular to the tread surface on a steel plate 0,20 m x 0,30 m in size and at least 25 mm thick, arranged as specified in 5.3.2.1, in the centre of the tread surface. After the test the step shall show no indication of crack initiation. Permanent deformation shall not be greater than 4 mm, measured at the tread surface. Steps or their component parts, e.g. inserts or fixings, shall be securely attached and not become loose. If rollers are damaged during the test, it is permissible to replace them.	6.1.3.5.7 8.3.11 8.3.11.1 8.3.11.2 8.3.11.3 8.3.11.4 8.3.11.5 8.3.11.6	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.3.3.3.1.2 Torsional test The step design shall be such that the structure can accommodate torsional loading equivalent to a ± 2 mm displacement of the trailer wheel centre, moving in an arc whose centre is the chain wheel centre. The ± 2 mm displacement is a relative to a trailer wheel to chain wheel centre distance of 400 mm. This ratio shall be maintained, when the 400 mm dimension is varied (see Annex F for test examples). The dynamic test shall be adjustable to ensure that the specified deflections above are achieved throughout the test. It shall be applied with one frequency between 5 Hz and 20 Hz for at least 5×10^6 cycles whereby an undisturbed sinusoidal force flow shall be achieved. After the test the step shall show no indication of crack initiation. Permanent deformation shall not be greater than 4 mm, measured at the tread surface. Steps or their component parts, e.g. inserts or fixings, shall be securely attached and not become loose.	No equivalent requirement.	No equivalent requirement.
5.3.3.3.2 Pallets 5.3.3.3.2.1 Load test The pallet, irrespective of its size, shall be tested in a horizontal position together with rollers (not rotating), axles or stub shafts (if existing). It shall be subjected to a load pulsating between 500 N and 3 000 N at one frequency between 5 Hz and 20 Hz for at least 5×10^6 cycles whereby an undisturbed sinusoidal force flow shall be achieved. It shall be applied perpendicular to the tread surface on a steel plate 0,20 m x 0,30 m in size and at least 25 mm thick, in the centre of the tread surface.	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
For pallets with a smaller length than 0,30 m the plate width shall be 0,20 m and the length of the plate shall be the length of the pallet. After the test, the pallet shall show no indication of crack initiation. Permanent deformation shall not be greater than 4 mm, measured at the tread surface. Pallets or their component parts, e.g. inserts or fixings, shall be securely attached and not become loose. If rollers are damaged during the test, it is permissible to replace them. 5.3.3.2.2 Torsional test A torsional test is only required if the pallets are fitted with trailer rollers. The pallet design shall be such that the structure can accommodate torsional loading equivalent to a ± 2 mm displacement of the trailer wheel centre, moving in an arc whose centre is the chain wheel centre. The ± 2 mm displacement is related to a trailer wheel to chain wheel centre distance of 400 mm. This ratio shall be maintained, when the 400 mm dimension is varied (see Annex F for test examples). The dynamic load shall be adjusted to achieve a deflection with a tolerance of - 5 % during the test. It shall be applied with one frequency between 5 Hz and 20 Hz for at least 5×10^6 cycles whereby an undisturbed sinusoidal force flow shall be achieved. For pallets with a smaller length than 0,30 m, the plate width shall be 0,20 m and the length of the plate shall be the length of the pallet. After the test, the pallet shall show no indication of crack initiation. Permanent deformation shall not be greater than 4 mm, measured at the tread surface. Pallets or their component parts, e.g. inserts or fixings, shall be securely attached and not become loose.	No equivalent requirement.	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
No equivalent requirement.	6.2.3.5.4 8.3.11 8.3.11.1 8.3.11.2 8.3.11.4 8.3.11.5 8.3.11.6	No equivalent requirement.
5.3.4 Guiding of steps, pallets and belt 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 and the vertical displacement shall not exceed 4 mm for steps and pallets and 6 mm for belts. This requirement applies only to the usable area of the steps, pallets or belt. Treadway supports for belts shall be provided at intervals not exceeding 2 m along the centre line of the treadway. These supports shall be located at a level not more than 50 mm below the underside of the treadway when it is loaded under the conditions required by 5.3.3.2.4.	6.1.3.8 (3) (a) 6.2.3.9 (c) (2)	MOC-N (No.1417-2000) 1. The structure of escalator devised so as persons or articles not to be caught, not to be colliding with obstacles prescribed by BSLJ-EO; Article 129-12, item 1, paragraph 1 shall be specified as in (1), (2), and (3). 1.(1) It shall be that the clearance between the side edge of the step and skirt guard panel is not more than 5 mm [see 2.4.1 Figure 3]. JIS A 4302:2006; Inspection standard of elevator, escalator, and dumbwaiter 5.4.2 Inspection to be carried out on upper and lower landings and on steps h) The clearance between adjoining on steps and that between skirt guard and steps shall be not exceeding 5 mm over the whole length of escalator.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.3.5 Clearance between steps or pallets The clearance between two consecutive steps or pallets in any usable position measured at the tread surface shall not exceed 6 mm (see Figure 5, details Y, Z, Figure 9, detail S and Figure 10, detail U). For steps the measurement shall be carried out as the dimensions of the gaps are indicated in Figure 5. For pallets the measurements shall be done according to Figures 9 and 10. Demarcation (e.g. groove in the step tread) shall be provided to highlight at the landings the rear edge of the steps. In the area of the transition curves of moving walks with meshed front edges and rear edges of the pallets, this clearance is permitted to be increased to 8 mm (see Figure 10, detail V).	6.1.3.5.4 (see Non-mandatory Appendix I, Fig. I-6). 6.2.3.5.2	MOC-N (No.1417-2000) 1. The structure of escalator devised so as persons or articles not to be caught, not to be colliding with obstacles prescribed by BSLJ-EO; Article 129-12, item 1, paragraph 1 shall be specified as in (1), (2), and (3). 1.(2) It shall be that the clearance between the adjacent steps is not more than 5 mm [see 2.4.1 Figure 2]. JIS A 4302:2006; Inspection standard of elevator, escalator, and dumbwaiter 5.4.2 Inspection to be carried out on upper and lower landings and on steps h) The clearance between adjoining on steps and that between skirt guard and steps shall be not exceeding 5 mm over the whole length of escalator. k) The safety marks on steps shall be clear. NOTE The colour of safety mark is yellow or orange.
5.3.6 Missing step or pallet device The operation of the escalator/moving walk is only permitted with a complete step/pallet band. Missing step/pallet shall be detected by a safety device or function in accordance with 5.12.2.7.11.	6.1.6.5 a), b)	No equivalent requirement.
5.4 Drive unit 5.4.1 Driving machine 5.4.1.1 General A drive unit shall not operate more than one escalator or moving walk.	6.1.5.2/6.2.5.2	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.4.1.2 Speed 5.4.1.2.1 The speed of an unloaded escalator shall not deviate by more than $\pm 5\%$ at nominal frequency and nominal voltage. 5.4.1.2.2 The nominal speed of the escalator shall not exceed: — 0,75 m/s for an escalator with an angle of inclination α up to 30°; — 0,50 m/s for an escalator with an angle of inclination α of more than 30° up to 35°.	6.1.4 6.1.4.1 6.1.4.1.1 6.1.4.1.2 a) b) c) d) e), 1), 2), 3) f) g)	JIS A 4302:2006; Inspection standard of elevator, escalator, and dumbwaiter 5.4.1 Inspection to be carried out in machinery room b) The measured speed shall not exceed 110 % of nominal speed under no load condition at landing. BSLJ-EO (Structure of Escalators) Article 129-12 1.(5) The rated speed of the steps shall be not more than the speed per minute designated by the minister of land, infrastructure, and transport according to the inclination of the escalators within the limit of not more than 50m/min. MOC-N (No.1413-2000) 2. The escalators of the special construction or the special use form to which the provisions described in the BSLJ-EO; Article 129-3, item 3, paragraph 2 are not applied, it shall conform to the construction method specified in each paragraph come under the kind of the escalators described in following each paragraph. (1) The escalator of which inclination exceeding 30°. In addition to conforming to the provisions stipulated in the BSLJ-EO; Article 129-12, item 1, paragraph 1, 3, and 4, it shall conform to the construction specified as follows. (b) It shall be that the rated speed of the step is less than 30m/min. MOC-N (No.1417-2000), EXP. 2.(1) and (2) Rated speed is stipulated corresponding to inclination. [see 2.4.2 Table 6 and 7]

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.4.1.2.3 The nominal speed of moving walks shall be not higher than 0,75 m/s. Deviating from the above a nominal speed up to 0,90 m/s is permitted provided the width of the pallets or the belt does not exceed 1,10 m, and at the landings, the pallets or the belt move horizontally for a length of at least 1,60 m before entering the combs. The before mentioned requirements do not apply to moving walks with acceleration paths or moving walk systems with direct transition to moving walks travelling at different speeds	6.2.4 6.2.4.1.2 a) b) c) d) e), 1), 2), 3) f) g)	MOC-N (No.1417-2000), EXP. 2. (1) and (2) Rated speed is stipulated corresponding to inclination. [see 2.4.2 Table 8] MOC-N (No.1413-2000) 2. The escalators of the special construction or the special use form to which the provisions described in the BSLJ-EO; Article 129-3, item 3, paragraph 2 are not applied shall conform to the construction method specified in each paragraph come under the kind of the escalators described in following each paragraph. 2.(3) The escalator of which speed varies in halfway of travel. It shall conform to the construction specified as follows. (h) It shall be that the speed of the step at the riding entrance and leaving exit is less than 50 m/min. EXP. 2. (3) Maximum speed of moving walk which is accelerated at intermediate section is not stipulated, but speed at entrance and exit is stipulated up to 50 m/min.
5.4.1.3 Link between operational brake and step, pallet or belt drive 5.4.1.3.1 For the link between the operational brake and the step, pallet or belt drive, preferably non-friction driving elements should be used such as shafts, gear wheels, multiplex chains, two or more single chains. Where friction elements are used such as trapezoidal belts (flat belts are not permitted) an auxiliary brake in accordance with 5.4.2.2 shall be used.	6.1.5/6.2.5 6.1.5.1/6.2.5.1 6.1.5.3/6.2.5.3 6.1.5.3.1 6.2.5.3.1 (e)	No equivalent requirement.
No equivalent requirement.	6.2.3.14	No equivalent requirement.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.4.1.3.2 The design of all driving elements shall be of nominal infinite fatigue life. Safety factors of all driving elements shall be at least 5 for static calculations. In the case of trapezoidal belts, at least 3 belts shall be applied. This safety factor is determined as the ratio between the breaking force of the driving element and the static force to which the driving element is subjected when the escalator or inclined moving walk carries the structural rated load according to 5.2.5 together with the tension force of the tensioning device. For horizontal moving walks the dynamic forces according to 5.4.2.1.3.3 respectively 5.4.2.1.3.4 together with the tension force of the tensioning device shall be used to determine the safety factor. NOTE: Driving elements are the parts which are moving and hence dynamically loaded, e.g. shaft, gear wheels, multiplex chains. The fixation of these parts in the truss has to be done according to the specific requirements of these components (e.g. Eurocode for the truss, welding and screws acc. to the relevant standards).	6.1.3.10/6.2.3.11 6.1.3.10.1 6.1.3.10.2/6.2.3.11.2 a) b) 6.2.3.11.1 6.1.3.10.2 a) b) 6.1.3.10.3 6.1.3.11	Refer to EN 115-1:2017, 5.4.3.
5.4.1.4 Hand winding device If a hand winding device is provided it shall be easily accessible and safe to operate (see 7.2.1.3 and 7.4.1 g) for instructions). If the hand winding device is removable a safety device or function according to 5.12.2.7.16 shall be provided. Crank handles or perforate hand wheels are not permitted.	No equivalent requirement.	JEAS-209 (2015) Standard of the escalator structure necessary for the maintenance and inspection. 3.4.1 The hand winding device shall be provided with the situation of interruption of main contactor.

Table 1 (continued)

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.4.2 Braking system	6.1.5.3/6.2.5.3	No equivalent requirement.
5.4.2.1 Operational brake	6.1.5.3.1/6.2.5.3.1	
5.4.2.1.1 General	a)	
5.4.2.1.1.1 Escalators and moving walks shall have an operational braking system by which they:	b)	
a) can be brought to rest with an uniform deceleration;	c)	
b) can be maintained stationary. See also 5.12.3.5.	d), 1), 2), 3), 4), 5)	
5.4.2.1.1.2 Operational braking by electro-mechanical brake. For operational braking by electro-mechanical brake the requirements of 5.4.2.1.2 apply.	e)	
5.4.2.1.1.3 Operational braking by electrical braking	6.1.6.7	
For electrical braking (e.g. electrical braking with inverter) the requirements according 5.4.2.1.1 a) shall be fulfilled.	6.2.6.8	
An electro-mechanical brake according to 5.4.2.1.2 is required and also to be initiated under 5.12.3.5.2	No equivalent requirement.	No equivalent requirement.
5.4.2.1.1.4 Operational braking by other means. Where the operational brake is effected by other means an auxiliary brake in accordance with 5.4.2.2 shall be provided;	No equivalent requirement.	No equivalent requirement.
5.4.2.1.1.5 Brakes that can be released by hand shall require continuous application of manual pressure to keep them open.	No equivalent requirement.	No equivalent requirement.