TECHNICAL REPORT

ISO/TR 14799-1

Third edition
2022-04

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

Reference number
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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 theses 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 accord-ance with Ministry of Construction Order, have a 1st-class licensed architect/building engineer, 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 equirements 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
		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
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	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 Not withstanding 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 buiding, sites of building, or the parts pf 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 addtion 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 buiding, sites of building, or the parts pf 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** pronged 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.
	Note - A17.1 have additional definitions with no equivalent in EN 115-1 and JIS	
3.2 Symbols and abbreviations See Table 1.	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). **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 55.12.3, 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 5.5.2.3, 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 h13 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 z1 (see Figure 4) of the escalator or moving walk) x (distance l1 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 l1 between the supports. Based on the structural rated load for the comb plate and floor plate the maximum deflection shall not exceed 4 mmd 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: **$P = 2\,600\ A\ N/m^2$** 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 ±1° 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 z1 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 halfway 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 x1 shall not exceed 0,24 m. 5.3.2.2.2 The step depth y1 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. 5.3.2.2.6 The depth h_7 of the grooves shall be not less than 10 mm. 5.3.2.2.7 The web width b_8 shall be at least 2,5 mm and not exceed 5 mm.	**6.1.3.5.5** **6.2.3.5.1** (see Non-mandatory Appendix I, Fig. I-10).	No equivalent requirement.
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) 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.	**6.2.3.6.2**	No equivalent requirement.
5.3.2.3.5 The belt shall not finish with a groove at the side edge of the belt. Splicing of the treadway belt shall be such as to provide a continuous unbroken treadway surface.	**6.2.3.6.2** **6.2.3.6.1**	No equivalent requirement.
5.3.3 Structural design **5.3.3.1 General** 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. 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. NOTE 6 000 N/ m^2 is derived from a structural rated load of 5 000 N/m2 (see 5.2.5) plus an impact factor of 1,2.	**6.1.3.9.4** **6.1.3.10.4** **6.2.3.10.4** **6.2.3.11.4**	(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)) **JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 3.3.1 The weight of step (pallet) and floor plate shall be 30kg or less. **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
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 mm^2, 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 mm^2, 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 m^2, 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 then 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.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.3.3.2.4 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 x 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 5.3.3.2.1, 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 x 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 x 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 then 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.		
5.3.3.3.2.2 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 x 10^6 cycles whereby an undisturbed sinusoidal force flow shall be achieved. For pallets with a smaller length then 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 un 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 un 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 ±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 respectfully 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 **5.4.2.1 Operational brake** **5.4.2.1.1 General** **5.4.2.1.1.1** Escalators and moving walks shall have an operational braking system by which they: a) can be brought to rest with an uniform deceleration; b) can be maintained stationary. See also 5.12.3.5. **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.	**6.1.5.3/6.2.5.3** **6.1.5.3.1/6.2.5.3.1** a) b) c) d), 1), 2), 3), 4), 5) e) **6.1.6.7** **6.2.6.8**	No equivalent requirement.
5.4.2.1.1.3 Operational braking by electrical braking For electrical braking (e.g. electrical braking with inverter) the requirements according 5.4.2.1.1 a) shall be fulfilled. 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.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.4.2.1.2 Electro-mechanical brake The normal lifting of the electro-mechanical brake shall be by a continuous flow of electric current. The braking operation shall be effective immediately after the electric brake circuit is opened. The brake force shall be generated by guided compression spring(s). Electrically generated self-excitation of the brake releasing device shall be impossible.	**6.1.5.3.1** **6.2.5.3.1** a) b)	**BSLJ-EO (Structure of escalator)** **Article 129-12, EXP.5** The brake shall be applied automatically if the electrical power supply is interrupted.
5.4.2.1.3 Brake load and stopping distances for operational brake **5.4.2.1.3.1 Determination of the brake load for escalators** Table 2 shall be applied for the determination of the brake load for escalators. The number of steps to be considered is determined by "rise h13 divided by maximum visible height of the step riser" (see x_1 in Figure 8). For the purpose of a test, the total brake load is permitted to be distributed over two-thirds of the number of steps thus obtained.	**6.1.3.9.3 Brake** a) b), 1), 2)	**JEAS-527 (2013)** Standard related to escalator braking device 3. Braking ability and design load of braking device The braking device of the escalator shall be stopped with the design load and it shall be able to maintain it when it comes to a stop state. The design load of the braking device shall be calculated as following, S600 65 kg/step S800 100 kg/step S1000 13 0kg/step If it exceeds S1000, it shall be calculated as 130 kg according to S1000.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.4.2.1.3.2 Stopping distances for the escalator The stopping distances for unloaded upwards, unloaded downwards and loaded downward moving escalators (see 5.4.2.1.3.1) shall be as given in Table 3. For intermediate nominal speeds the stopping distances shall be interpolated. The stopping distances shall be measured from the time the electric stopping device is actuated. The deceleration, measured on a downward moving escalator, in the direction of travel shall not exceed 1 m/s2 during the operation of the braking system. For measuring purposes, the raw deceleration signal shall be band-limited using a 4,0 Hz low-pass two-pole Butterworth filter. It is recommended to achieve the shortest possible stopping distance within the given deceleration limit.	**6.1.5.3.1** (c)	**BSLJ-EO (Structure of escalator)** **Article 129–12** 5. The constructions of the preceding emergency stopping devices shall be the construction methods specified by the minister of land, infrastructure, and transport so as to have performance which operate automatically and enable to stop the steps safely with the deceleration in operating direction of not more than 1,25 m/sec^2 when power supply fail, break down of driving devices, person or articles are caught, and in case of that persons are liable to be injured or articles are damaged or the construction methods approved by the minister of land, infrastructure, and transport. **MOC-N (No.1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below 1.(3) When any situations described in preceding (a) to (e) are detected, the stopping distance of the escalators with no load condition shall be not less than the value obtained by the following formula and not exceeding 0,6 m for the escalator with inclination of 15° and more or the escalator with the difference in level between each adjacent steps is exceeding 4 mm. S = v2/9 000 where: S is the stopping distance of the step (unit m), v is the rated speed of the escalator (unit m/min.)

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.4.2.1.3.3 Determination of the brake load for moving walks Table 4 shall be applied for the determination of the brake load for moving walks. To determine the brake load for moving walks which in their length overcome several inclinations (differences in level), only the downward moving sections shall be considered	**6.2.3.10.3** a), 1), 2) b), 1), 2)	No equivalent requirement.
5.4.2.1.3.4 Stopping distances for moving walks The stopping distances for unloaded upwards, unloaded downwards and loaded downward moving inclined moving walks (see 5.4.2.1.3.3) shall be as given in Table 5. This applies also for unloaded and loaded horizontal moving walks in both directions. For intermediate nominal speeds the stopping distances shall be interpolated. The stopping distances shall be measured from the time the electric device for stopping is actuated.	**6.2.5.3.1** (c) (see Non-mandatory Appendix I, Fig. I-11).	**BSLJ-EO (Structure of escalator)** **Article 129–12** 5. The constructions of the preceding emergency stopping devices shall be the construction methods specified by the minister of land, infrastructure, and transport so as to have performance which operate automatically and enable to stop the steps safely with the deceleration in operating direction of not more than 1,25 m/sec^2 when power supply fail, break down of driving devices, person or articles are caught, and in case of that persons are liable to be injured or articles are damaged or the construction methods approved by the minister of land, infrastructure, and transport.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
The deceleration, measured on a downward moving or horizontal moving walk, in the direction of travel shall not exceed 1 m/s2 during the operation of the braking system. For measuring purposes, the raw deceleration signal shall be band-limited using a 4,0 Hz low-pass two-pole Butterworth filter. It is recommended to achieve the shortest possible stopping distance within the given deceleration limit. For moving walks a brake test under no load will be sufficient. For loaded moving walks, the manufacturer shall prove the stopping distances by calculation (see 6.2 c).		**MOC-N (No.1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below. 1.(3) When any situations described in preceding (a) to (e) are detected, the stopping distance of the escalators with no load condition shall be not less than the value obtained by the following formula and not exceeding 0,6 m for the escalator with inclination of 15° and more or the escalator with the difference in level between each adjacent steps is exceeding 4 mm. S = v2/9 000 where: S is the stopping distance of the step unit m); v is the rated speed of the escalator (unit m/min).
5.4.2.2 Auxiliary brake **5.4.2.2.1** Escalators and inclined moving walks shall be equipped with auxiliary brake(s) if: a) the connection between the operational brake (see 5.4.2.1) and the driving sprockets of the steps/pallets or the drum of the belt is not accomplished by shafts, gear wheels, multiplex chains, or more than one single chain, or b) the operational brake is not an electromechanical brake according to 5.4.2.1.2, or c) the rise h13 exceeds 6 m (see also H.2).	**6.1.5.3.2** **6.2.5.3.2**	**MOC-N (No.1424–2000), EXP. 2** The escalator shall be provided with the following safety devices and shall be stopped depend on detecting the operation of these safety devices. [Notice of designing]. Although not stipulated in this regulation, for the escalator which uses the chain (called as the main drive chain) to transmit the driving force from the driving machine to the step chain sprocket, it is required to furnish the escalator with the mechanical brake to prevent the step from descending and the safety switch to stop the driving motor when the main drive chain brakes.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
The connection between the auxiliary brake and the driving sprockets of the steps/ pallets or the drum of the belt shall be accomplished by shafts, gear wheels, multiplex chains or more than one single chain. It is not permissible for the connection to comprise friction drives, i.e. clutches.		In this case, it needs rapidly to stop the stopping distance of the escalators allowed to over the value obtained by the formula described in item (3).
5.4.2.2.2 The auxiliary braking system shall be dimensioned in such a way that escalators and moving walks travelling with brake load downward are brought to rest by effective retardation and maintained stationary. The deceleration of 1 m/s^2 downward shall not be exceeded under all operating conditions. For measuring purposes, the raw deceleration signal shall be band-limited using a 4,0 Hz low-pass two-pole Butterworth filter. Upon operation of auxiliary brakes it is not necessary to keep the stopping distances defined for the operational brake (see 5.4.2.1.3).	No equivalent requirement.	No equivalent requirement.
5.4.2.2.3 Auxiliary brakes shall be of the mechanical (friction) type.	**6.1.5.3.2 /6.2.5.3.**	No equivalent requirement.
5.4.2.2.4 Auxiliary brakes shall stop according to 5.12.3.5.3. The activation of the auxiliary brake shall be detected by electrical safety device or function according to 5.12.2.7.4	**6.1.6.3.4**	No equivalent requirement.
No equivalent requirement.	**6.1.6.3.4**	No equivalent requirement.
5.4.2.2.5 Auxiliary brake(s) are permitted to operate together with the operational brake when in case of power failure or of an interruption of a safety circuit the stopping conditions according to 5.4.2.1.3.2 and 5.4.2.1.3.4 are kept; otherwise a simultaneous operation of the auxiliary and the operational braking system is only permitted under the conditions of 5.4.2.2.4.	No equivalent requirement	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.4.2.3 Protection against risks of excessive speed and unintentional reversal of the direction of travel A safety device or function according to 5.12.2.7.2 and 5.12.2.7.3 shall be provided.	**6.1.6.3.2** a) b)	No equivalent requirement.
5.4.3 Steps and pallets drive **5.4.3.1** The steps of escalators shall be driven by at least two chains of which at least one shall be located on each side of the step. The pallets of moving walks are permitted to be driven by only one chain if the parallel movement of the pallets in the usable area is ensured by other mechanical measures. A safety device or function according to 5.12.2.7.5 shall be provided to detect breakage or undue elongation of the step/pallet chains.	**6.1.3.11/6.2.3.12** **6.1.6.3.3** a), 2)	**BSLJ-EO (Structure of escalator)** **Article 129–12** **2.** The provisions of Article 129-4 (excluding paragraph 3 item (5) through (7)) and Article 129-5 paragraph 1 shall apply mutatis mutandis to escalators installed in buildings. In this case, each of the terms specified in the center column of the following table that appears in the provisions specified in the left column of the said table shall be replaced with the corresponding term in the right column of the said table. [For “the following table” and “the said table”, see 2.4.2 Table 1] (Applied content of BSLJ-EO; Aricle 129-4 3.(2)) Those parts of the principal support parts that may incur abrasion or fatigue damage shall consist of two or more parts and each shall be capable of independently supporting the step or the suspension of the step. **MOC-N (No. 1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		1.(2) It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm]. **(a)** The extraordinary extension of the step chains. **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.
5.4.3.2 The step/pallet chain design shall be of nominal infinite fatigue life. The safety factor against breaking of each chain shall be at least 5 (see 5.4.1.3.2) with respect to structural steel according to EN 10025 1:2004 in combination with EN 10025 2:2004, EN 10025 3:2004, EN 10025 4:2004, EN 10025 5:2004 and EN 10025 6:2004+A1:2009 and with respect to quenched and tempered steel according to EN 10083 1:2006 in combination with EN 10083 2:2006 and EN 10083 3:2006. The chain shall be subject to a tensile test, When more than one chain is used it is assumed that the load is equally distributed over the chains.	**6.1.3.10.3/6.2.3.11.3**	**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.(3) The safety factor of the chain and other similar equipment and hitch part of the chain or belt for the escalators shall be not less than the value described in the following table. [see 2.4.2 Table 4] 2.(4) In the BSLJ-EO; Article 129–12, item 2, the critical safety factor stipulated in the BSLJ-EO; Article 129–4, item 2, paragraph 4 applied mutatis mutandis (restricted to that the step is not supported by the other equipment not liable to abrasion or fatigued destruction) shall be not less than the value described in the following table. [see 2.4.2 Table 5]

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.4.3.3 The chains shall be tensioned continuously. A safety device or function according to 5.12.2.7.6 shall be provided to detect movement of the return device. Springs working in tension are not permitted for the tensioning device. When weights are used for tensioning they shall be safely retained should their suspension break.	**6.1.6.3.3** b), 3) c)	**MOC-N (No. 1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below. **1.(2)** It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm]. **(a)** The extraordinary extension of the step chains. **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. a) The installation of a stop switch that operates when the step chain abnormally elongates or breaks is strong, and the operation of a switch shall be reliable.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.4.4 Belt drive **5.4.4.1** The factor of safety of the belt including splicing shall be at least 5 (see 5.4.1.3.2) for the dynamic forces according to 5.4.2.1.3.3 respectively 5.4.2.1.3.4. The calculation shall be carried out for the worst case.	**6.2.3.11.5**	**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.(3) The safety factor of the chain and other similar equipment and hitch part of the chain or belt for the escalators shall be not less than the value described in the following table. [see 2.4.2 Table 4] 2.(4) In the BSLJ-EO; Article 129–12, item 2, the critical safety factor stipulated in the BSLJ-EO; Article 129–4, item 2, paragraph 4 applied mutatis mutandis (restricted to that the step is not supported by the other equipment not liable to abrasion or fatigued destruction) shall be not less than the value described in the following table. [see 2.4.2 Table 5]
5.4.4.2 The belt shall be driven by drums and be tensioned continuously and automatically. A safety device or function according to 5.12.2.7.6 shall be provided to detect movement of the return device Springs working in tension are not permitted for the tensioning device. When weights are used for tensioning they shall be safely retained should their suspension break.	No equivalent requirement.	No equivalent requirement.
5.5 Balustrade **5.5.1 General** Balustrades shall be installed on each side of the escalator or moving walk.	**6.1.3.3/6.2.3.3** (see Non-mandatory Appendix I, Fig. I-3).	**BSLJ-EO (Structure of escalator) Article 129–12** 1.(3) Escalators shall be provided with handrails at each side of steps (the portion going up and down on which the persons step). The upper surface of the handrails shall move in the same direction and at the same speed as the steps.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.5.2 Dimensions of balustrade 5.5.2.1 In the inclined section the vertical height h1 from step nose or pallet surface or belt surface to top of the handrail shall be not less than 0,90 m and not exceed 1,10 m (see Figures 5 and 6).	**6.1.3.4.5 6.2.3.2.2**	No equivalent requirement.
5.5.2.2 The balustrades shall have no parts on which a person would normally stand. Appropriate measures shall be taken to discourage people from climbing on the outsides of the balustrade if there is a danger of people falling from them. To ensure this, on escalators and moving walks devices (see 1 in Figure 7) shall be provided on the lower outer decking at a point (1 000 ± 50) mm above the floor level (see h_9 in Figure 7) where the bottom of the device intersects with the balustrade decking and shall extend to a length l_5 of at least 1 000 mm parallel with the balustrade decking where no stepping is possible. The device shall extend to at least a height in line with the top of the handrail not conflicting with the requirements of b_{10} and b_{12}. Where escalators or moving walks are located adjacent to walls, devices (see 2 in Figure 7) to restrict access to the balustrade decking shall be provided at the top and bottom ends of these walls when the lower outer decking width b_{13} exceeds 125 mm. On adjacent parallel arrangements, this protection shall be provided when the combined balustrade decking width b_{14} exceeds 125 mm. The device shall extend to the height h_{10}. All exposed fastener heads for the devices shall be of the vandal resistant type.	**6.1.3.3.12** (see Non-mandatory Appendix I, Fig. I-6). a) **6.1.3.3.13** a) b) c) **6.2.3.3.8** a) b) c) d)	**JEAS-422 (2013)** Standard for surroundings and supervision of escalator/moving walk. 3.1.5 Anti-climbing partition plate If there is any possibility that children can easily approach the side of the escalator/moving walk go upstairs on the deck board for fun, a partition plate, etc. shall be furnished halfway on the deck board to prevent them for safety measures. Furthermore, it is recommended that partition plates to prevent climbing up be furnished at two locations on one side.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Where handrail level balustrade decking are provided between escalators/inclined moving walks and adjacent walls, anti-slide devices (see 3 in Figure 7) shall be provided on the balustrade decking when the distance b_{15} between the structure of the building (wall) and the centreline of the handrail is greater than 300 mm. These devices shall consist of objects fastened to the balustrade decking, no closer than 100 mm to the handrail (see b_{17}) and spaced no greater than 1 800 mm apart. The height h_{11} shall be not less than 20 mm. The devices shall have no sharp corners or edges. The above mentioned also applies to adjacent escalators/inclined moving walks when the distance b_{16} between the centrelines of the handrails is greater than 400 mm.		
5.5.2.3 Balustrades shall be designed to resist the simultaneous application of a static lateral force of 600 N and a vertical force of 730 N, both equally distributed over a length of 1 m and acting on the top of the handrail guiding system in the same place.	**6.1.3.3.2/6.2.3.3.2**	**JEAS-525 (2009)** Standard for glass application of escalator inner panel EXP. 3.2. Balustrades shall be designed to resist the simultaneous application of a static lateral force of 600 N and a vertical force of 730 N both equally distributed over a length of 1 m and acting on the top of the handrail guiding system in the same place.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.5.2.4 The parts of the balustrade facing the steps, pallets or belt shall be smooth and flush. Covers not in the direction of travel shall not project more than 3 mm. They shall be rigid and have rounded or bevelled edges. Covers of such nature are not permitted at the skirting. Cover joints in the direction of travel (in particular between the skirting and the interior panel) shall be arranged and formed in such a manner as to eliminate any risk of harm caused by trapping. Gaps between the interior panels of the balustrade shall be not wider than 4 mm. The edges shall be rounded off or bevelled. When a force of 500 N is applied to the interior panel at any point of the panelling at right angles to the surface over a square or round area of 2 500 mm^2, there shall be no gap greater than 4 mm and no permanent deformation. If glass is used for the interior panel it shall be toughened glass. The minimum thickness of 6 mm shall apply to single layer balustrades. When multi-layer glass balustrades are used, they shall be laminated toughened glass, the thickness of at least one layer shall also be not less than 6 mm.	**6.1.3.3.1** **6.2.3.3.1** a), 1), 2) b) 1), 2), 3) c) a) 1), 2) b) 1), 2), 3) c) **6.1.3.3.3** **6.2.3.3.3** (b)	**BSLJ-EO (Structure of escalator) Article 129–12** 1.(1) As specified by the minister of land, infrastructure, and transport, escalators shall be devised so as persons or articles not to be caught and so as not to be collide with obstacles under the normal using condition. **MOC-N (No.1417–2000)** **EXP. 1** The escalator of this notification includes moving walks and escalator for person sitting on wheelchair. Further, the interior panel should be smooth and durable construction without rugged portion as much as possible and it should be installed so as not to catch hands or fingers of the passengers. **JEAS-525 (2009)** **Standard for glass application of escalator inner panel.** **3.1** If glass is used for the interior panel, it shall be toughened glass (equivalent of JIS R 3206) and at least 6 mm thickness. [see 2.4.1 Figure 3] **EXP 3.3** The glass with shatterproof film (equivalent of JIS A 5759 class GS or SF) shall be provided to reduce the risk when self-destruction of glass is developed.
5.5.2.5 The horizontal distance (measured at right angles to the direction of travel) between the interior panel at lower points shall be equal to or less than the horizontal distance measured at points higher up.	No equivalent requirement.	No equivalent requirement.
5.5.2.6 The lower inner decking and the interior panel shall have an angle of inclination γ of at least 25° to the horizontal (see Figure 6). This does not apply to the horizontal part of the lower inner decking that directly joins the interior panel (see b_4 in Figure 6).	**6.1.3.3.4/6.2.3.3.4** (see Non-mandatory Appendix I, Fig. I-1and I-9). (b)	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.5.2.6.1 The horizontal part b_4 up to the interior panel shall be less than 30 mm.	**6.1.3.3.4** **6.2.3.3.4** (c)	No equivalent requirement.
5.5.2.6.2 The width b_3, measured horizontally, of each lower inner decking inclined at an angle of less than 45° to the horizontal shall be less than 0,12 m (see Figure 6).	**6.1.3.3.4** **6.2.3.3.4** (a) **6.1.3.3.4** (d)	**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 corresponding side of the steps shall be not more than 25 cm. [see 2.4.1 Figure 3]
5.5.3 Skirting **5.5.3.1** The skirting shall be vertical, plain and butt-jointed. NOTE However, special arrangements instead of butt-jointing (e.g. sliding joints) will possibly be necessary for long moving walks at the points where they pass over building expansion joints.	**6.1.3.3.6** **6.2.3.3.6** (c)	No equivalent requirement.
5.5.3.2 The perpendicular (i.e. 90°) distance h2 between top edge of skirting or bottom edge of projecting cover joints or the lower edge of the rigid part of skirt deflectors and the line of the step nose or the tread surface of the pallets or belt shall be not less than 25 mm (see Figure 6).	**6.1.3.3.6** **6.2.3.3.6** (a) (see Non-mandatory Appendix I, Fig. I-4).	No equivalent requirement.
5.5.3.3 The skirting including lighting and other devices shall yield not more than 4 mm under a single force of 1 500 N acting at the most unfavourable point at right angles to the surface over a square or round area of 2 500 mm^2. No permanent deformation shall result from this. This shall be met up to a height of 25 mm above the line of the step nose or the tread surface of the pallets or belt. Above the height of 25 mm the force requirements of the balustrade of 500 N (see 5.5.2.4) shall be fulfilled. See Figure 5 detail R.	**6.1.3.3.6/6.2.3.3.6** (b) (c)	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.5.3.4 On escalators, the possibility of trapping between skirting and steps shall be minimized. For this purpose, the following four conditions shall be fulfilled: a) sufficient rigidity of the skirting according to 5.5.3.3; b) clearances to be in accordance with 5.5.5.1; c) installation of skirt deflectors which fulfil the following requirements:	**6.1.3.3.6/6.2.3.3.6** (c) (d) **6.1.3.3.7** (see Non-mandatory Appendix I, Fig. I-4);	**BSLJ-EO (Structure of escalator) Article 129–12** **1.(1)** As specified by the minister of land, infrastructure, and transport, escalators shall be devised so as persons or articles not to be caught and so as not to collide with obstacles under the normal using condition. **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]
— They shall consist of a rigid and a flexible part (e.g. brushes, rubber profiles). — They shall have a minimum projection of 33 mm and a maximum of 50 mm from the vertical face of the skirt panels. — They shall withstand a force of 900 N uniformly distributed on the projected area of the rigid part over a rectangular area of 600 mm2 vertically to the line of attachment of the rigid part without detachment or permanent deformation.	**6.1.3.3.7** b) c) d) e) f) **6.1.3.3.8** **6.1.3.3.9** a) b), 1), 2), 3), 4), 5)	EXP. 1.(1) The horizontal clearance between the steps and the skirt guard panel (at one side) should not exceed 5 mm in the condition that no force is acting on the skirt guard panel when the escalator stands still. For the moving walks in which the skirt guard panel is placed above the steps, the vertical clearance between the tread surface and lower portion of the skirt guard panel should not exceed 5 mm when the escalator stands still. **MOC-N (No. 1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— The rigid parts shall have a horizontal projection of between 18 mm and 25 mm and withstand the defined strength requirements. The horizontal projection of the flexible part shall have a minimum of 15 mm and a maximum of 30 mm. — A distance of between 25 mm and 30 mm shall be provided between the lowest part of the underside of the rigid part and perpendicular to the line of the step nose, throughout the inclined portion of travel. — The distance between the lowest part of the underside of the rigid part of the skirt deflector and the top of any step cleat in the transition and horizontal areas shall be between 25 mm and 55 mm. — The lower surface of the rigid part shall be bevelled not less than 25° upward and the upper surface shall be bevelled not less than 25° downward from skirt panel. — Deviating from Figure 3 a, it is permitted to provide a flat surface perpendicular to the skirt with a width ≤ 5 mm that is followed by an increasing downward (on the top)/upward (on the bottom) convex slope. The shape shall reach an inclination of 25° at least in half of the horizontal projection of the rigid part (Figure 3 b) — If there is a flat surface perpendicular to the skirt followed by straight slope (≥ 25°) on the top a width ≤ 10 mm and on the bottom a width ≤ 5 mm is permitted (Figure 3 c).	c), 1), 2) **6.1.3.3.10** a), 1), 2), 3), 4) b), 1), 2), 3), 4)	The structure of the braking devices for the escalator shall conform to each paragraph described below. **1.(2)** It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm]. **(d)** A person or article is caught between a side of the step and skirt guard panels in the vicinity of landings. **JIS A 4302:2006;** **Inspection standard of elevator, escalator, and dumbwaiter.** **5.4.2 Inspection to be carried out un upper and lower landings and on steps** **h)** The clearance between adjoining 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
— The deflectors shall be designed with rounded edges. Fastening heads and joint connections shall not extend into the path of travel. — The terminal end piece shall be tapered to give a flush interface with the skirting. The terminal end piece of any deflector device shall end not less than 50 mm and maximum 150 mm prior to the comb intersection line. — If the skirt deflector is an extension of the lower inner decking, 5.5.2.6.2 applies. If the skirt deflector is attached or an integral part of the skirting, 5.5.3.1 apply. d) use of suitable materials or suitable type of lining underneath the deflector device in order to achieve a coefficient of friction for rubber with a testing lubricant less than 0,45. This rubber is defined as SBR-rubber consisting of SBR caoutchouc, mineral fillings, processing additives, crosslinking agents with a density of (1,23 ± 0,2) g/cm^3, and a Shore D-hardness 50 ± 3 according EN ISO 868:2003. Testing lubricant is defined as a solution composed of sodium dodecyl sulfate (pureness ≥ 99 %) de-ionized or distilled water (for information on test methods, see Annex K).		
No equivalent requirements	**6.1.3.5.6**	**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 k) The safety marks on steps shall be clear. NOTE The colour of safety mark is yellow or orange.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.5.4 Newel **5.5.4.1** The newel including the handrails shall project horizontally beyond the comb intersection line by at least 0,60 m in longitudinal direction (see L_2 and l_2 in Figure 5 and detail X).		No equivalent requirement.
5.5.4.2 The horizontal portion of the handrail shall continue longitudinally at the landings for a distance l3 (see Figure 5) of at least 0,30 m past the comb intersection line (see L2 in Figure 5 and detail X). In the case of inclined moving walks without a horizontal section at the landings, the continuation of the handrail parallel to the angle of inclination is permitted.	**6.1.3.4.2** **6.2.3.4.2**	**MOC-N (No.1417–2000)** **EXP. 2**[Notice of designing] Escalator of which rated speed exceeding 30m/min and not more than 45m/min should take the following (1) to (3) measures for the stable position of passenger. **(2)** Horizontal distance between a comb and edge of the handrail return section should 0.3m or more for the stable position of passenger when landing on the moving step.
5.5.5 Clearance between steps, pallets or belt and skirting **5.5.5.1** Where the skirting of escalators or moving walks is placed beside the steps and pallets or the belt the horizontal clearance shall not exceed 4 mm at either side, and 7 mm for the sum of clearances measured at both sides at two directly opposite points.	**6.1.3.3.5**	**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]. EXP. 1.(1) The horizontal clearance between the steps and the skirt guard panel (at one side) shall not exceed 5 mm in the condition that no force is acting on the skirt guard panel when the escalator stands still. For the moving walks in which the skirt guard panel is placed above the steps, the vertical clearance between the tread surface and lower portion of the skirt guard panel shall not exceed 5 mm when the escalator stands still.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		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 steps and that between skirt guard and steps shall be not exceeding 5 mm over the whole length of escalator.
5.5.5.2 Where the skirting of moving walks finishes above the pallets or the belt, the clearance shall not exceed 4 mm measured vertically from the tread surface. Motion of the pallets or the belt in lateral direction shall not cause a gap between the sides of the pallets or the belt and the vertical projection of the skirting.	**6.2.3.3.5** a) b)	No equivalent requirement.
5.6 Handrail system **5.6.1 General** On the top of each balustrade there shall be provided a handrail moving in the same direction and at a speed with a tolerance of – 0 % to + 2 % relative to the speed of the steps, pallets or belt under normal operating conditions. A handrail speed monitoring device or function shall be provided according to 5.12.2.7.13.	**6.1.3.4/6.2.3.4** **6.1.3.4.1/6.2.3.4.1**	**BSLJ-EO (Structure of escalator)** **Article 129–12** 1.(3) Escalators shall be provided with handrails at each side of steps (the portion going up and down, on which the persons step). The upper surface of the handrails shall move in the same direction and at the same speed as the steps. **JIS A 4302:2006;** Inspection standard of elevator, escalator, and dumbwaiter. 5.4.2 Inspection to be carried out un upper and lower landings and on steps. d) A handrail shall be moved in the same direction and at substantially the same speed as the steps.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
No equivalent requirement.	No equivalent requirement.	**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. e) During downward operation, the handrail shall not be stopped by a human power of about 150 N pulling horizontally at the upper landing.
5.6.2 Profile and position **5.6.2.1** The handrail profiles and their guides on the balustrades shall be formed or enclosed in such a way that the possibility of pinching or trapping of fingers or hands is reduced. The handrail shall be a minimum of 80 mm horizontally (b_{10}) and 25 mm vertically (b_{12}) away from adjacent surfaces. The reduction of this area is permitted as long as b18 is not less than 8 mm as shown in detail W of Figure 6 (Point A on the handrail profile – Point B vertically minimum 25 mm below the lower edge of the handrail and horizontally maximum to the outer edge of the handrail). No point of the balustrade shall be above the direct line from A to B. The distance between the handrail profile and guide or cover profiles shall under no circumstances be wider than 8 mm (see b_6' and b_6'' in Figure 6, detail W).	**6.1.3.4.6/6.2.3.4.5**	No equivalent requirement.
No equivalent requirement.	**6.1.3.4.4/6.2.3.4.4**	No equivalent requirement.
5.6.2.2 The width b_2 of the handrail shall be between 70 mm and 100 mm (see Figure 6, detail W).	See Annex I, Fig. I-1 and Fig. I-9.	No equivalent requirement.
5.6.2.3 The distance b5 between the handrail and the edge of the balustrade shall not exceed 50 mm (see Figure 6).	See Annex I, Fig. I-1 and Fig. I-9.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.6.3 Distance between the handrail centre lines The distance b_1 between the centre line of the handrails shall not exceed the distance between the skirting by more than 0,45 m (see b_1 and z_2 in Figure 6).	**6.1.3.2.2/6.2.3.2.3** (see Non-mandatory Appendix I, Figs. I-1 and I-2/Fig. I-9).	**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 said side of the steps shall be not more than 25 cm [see 2.4.1 Figure 3]. **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.(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 halfway 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
5.6.4 Handrail entry **5.6.4.1** The lowest point of entry of the handrail into the newel shall be at a distance h_3 from the finished floor level which shall be not less than 0,10 m and not exceed 0,25 m (see Figures 5 and 5).	No equivalent requirement.	No equivalent requirement.
5.6.4.2 The horizontal distance l4 between the furthest point reached by the handrail and the point of entry into the newel shall be at least 0,30 m (see Figure 5). If l_4 is greater than (l_2 - l_3 + 50 mm) the handrail shall enter into the balustrade at an angle α of at least 20° measured to the horizontal.	No equivalent requirement.	No equivalent requirement.
5.6.4.3 At the point of entry of the handrail into the newel a guard shall be installed to protect against pinching of fingers and hands. A safety device or function according to 5.12.2.7.9 shall be provided.	**6.1.3.4.3/6.2.3.4.3**	**MOC-N (No.1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below. **1.(2)** It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm].

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		(e) A person or article is caught in the inlet of the handrail. **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. f) The appropriate protective equipment shall be provided at the inlet of the handrail. The operation of the handrail inlet switch shall be certain.
5.6.5 Guiding The handrail shall be guided and tensioned in such a way that it will not leave its guides during normal use.	No equivalent requirement.	No equivalent requirement.
5.7 Landings **5.7.1 Surface properties** The landing area of escalators and moving walks (i.e. comb plate and floor plate) shall have a surface that provides a secure foothold for a minimum distance of 0,85 m measured from the root of the comb teeth (see L_1 in Figure 5 and detail X). NOTE For definition of materials and test methods, see Annex J. Exempt from this are the combs mentioned in 5.7.3.	**6.1.3.5.1** (c) **6.2.3.5.5** (c)	**JEAS-209 (2015)** Standard of the escalator structure necessary for maintenance and inspection. 3.3.1 The weight of step (pallet) and floor plate shall be 30kg or less.
5.7.2 Configuration of steps, pallets and belts **5.7.2.1** At the upper and lower landing, the steps of the escalator shall be guided in such a way that the front edges of the steps leaving the comb and the rear edges of the steps entering the comb are moving horizontally for a length of at least 0,80 m measured from point L_1 (see Figure 5 and detail X).	**6.1.3.6.5** **6.2.3.5.3**	**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

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
At nominal speeds above 0,50 m/s and not more than 0,65 m/s or rises h13 above 6 m this length shall be at least 1,20 m, measured from point L1 (see Figure 5 and detail X). At nominal speeds above 0,65 m/s this length shall be at least 1,60 m measured from point L1 (see Figure 5 and detail X). A vertical difference in level between two consecutive steps of 4 mm is permitted.		**2.(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. **(e)** At the landings, the difference between two or more steps (except the chamfer part where inclination angle of steps is 15 degree or less) shall be 4mm or less.
5.7.2.2 For escalators, the radius of curvature in the upper transition from incline to horizontal shall be: — at least 1,00 m for nominal speeds v ≤ 0,5 m/s (inclination of max. 35°); — at least 1,50 m for nominal speeds 0,5 m/s < v ≤ 0,65 m/s (inclination of max 30°); — at least 2,60 m for nominal speeds v > 0,65 m/s (inclination of max 30°). The radius of curvature in the lower transition from incline to horizontal of the escalator shall be at least 1,00 m up to 0,65 m/s the nominal speed and at least 2,00 m above 0,65 m/s.	No equivalent requirement.	No equivalent requirement.
5.7.2.3 For belt moving walks, the radius of curvature in the transition from incline to horizontal shall be at least 0,40 m. For pallet moving walks, it is not necessary to determine the radius of curvature because, on account of the maximum permissible distance between two consecutive pallets (see 5.3.5), it will always be sufficiently large.	No equivalent requirement.	No equivalent requirement.
5.7.2.4 At the upper landings of moving walks with an inclination of more than 6°, the pallets or belt shall move for a length of at least 0,40 m at a maximum angle of 6° before entering or after leaving the comb.	**6.2.3** **6.2.3.1**	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Analogous to 5.7.2.1, for pallet moving walks the movement is specified as follows: The front edge of the pallet leaving the comb and the rear edge of the pallet entering the comb shall move without changing the degree of angle over at least 0,40 m.		
5.7.2.5 Provisions shall be made in the area of the combs to ensure the correct meshing (see 5.7.3.3) of the comb teeth with the grooves of the tread surface. A safety device or function according to 5.12.2.7.10 shall be provided. Belts shall be supported in this area in a suitable manner, e.g. by drums, rollers, sliding plates.	**6.1.3.6.1/6.2.3.8.1** c) d)	**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. g) The engagement between the grooves on the steps and the comb plate teeth on the upper and lower landings shall be adequate enough, and there is no risk of easy jamming of things.
5.7.3 Combs **5.7.3.1 General** Combs shall be fitted at both landings to facilitate the transition of users. The combs shall be easily replaceable.	**6.1.3.6/6.2.3.8** **6.1.3.6.1/6.2.3.8.1** (a)	No equivalent requirement.
5.7.3.2 Design **5.7.3.2.1** The teeth of the combs shall mesh with the grooves of the steps, pallets or belt (see 5.7.3.3). The width of the comb teeth shall be not less than 2,5 mm, measured at the tread surface (see Figure 5, detail X).	**6.1.3.6.1/6.2.3.8.1** (b)	**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 g) The engagement between the grooves on the steps and the comb plate teeth on the upper and lower landings shall be adequate enough and there is no risk of easy jamming of things.
5.7.3.2.2 The ends of the combs shall be rounded off and so shaped as to minimize the risk of trapping between combs and steps, pallets or belt. The radius of the teeth end shall be not greater than 2 mm.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.7.3.2.3 The teeth of the comb shall have a form and inclination so that the feet of users, leaving the escalator or moving walk, should not stub against them. The design angle ß shown in Figure 5, detail X shall not exceed 35°.	No equivalent requirement.	No equivalent requirement.
5.7.3.2.4 The combs or their supporting structure shall be adjustable, to ensure correct meshing (see Figure 5, detail X).	**6.1.3.6.1/6.2.3.8.1** (c)	No equivalent requirement.
5.7.3.2.5 The combs shall have such a design that upon trapping of foreign bodies either their teeth deflect and remain in mesh with the grooves of the steps, pallets or belt, or they break.	No equivalent requirement.	No equivalent requirement.
5.7.3.2.6 A safety device or function according to 5.12.2.7.7 shall be provided.	**6.1.6.3.13/6.2.6.3.11** a) b)	No equivalent requirement.
No equivalent requirement.	**6.1.3.6.2/6.2.3.8.2**	No equivalent requirement.
5.7.3.3 Mesh depth of the combs into the grooves **5.7.3.3.1** The mesh depth h8 of the combs into the grooves of the tread (see Figure 5, detail X) shall be at least 4 mm.	**6.1.3.6.1/6.2.3.8.1** (b)	No equivalent requirement.
5.7.3.3.2 The clearance h6 (see Figure 5, detail X) shall not exceed 4 mm	**6.1.3.6/6.2.3.8** **6.1.3.6.1** **6.2.3.8.1** (d)	No equivalent requirement.
5.8 Machinery spaces, driving station and return stations **5.8.1 General** These rooms/spaces shall be used only for accommodating the equipment necessary for the operation and maintenance and inspection of the escalator or moving walk.	**6.1.7.3.4/6.2.7.3.4** 6.1.3.4/6.2.3.17	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 3.6 Prevention of pinching and catching. 3.6.1 The guard or yellow sign etc. shall be provided at the rotating parts that may be inadvertently contacted by workers during in operation.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Fire alarm systems, equipment for direct fire abatement and sprinkler heads, provided they are sufficiently protected against incidental damage, are permitted in these rooms provided they do not generate additional risks for maintenance operation. NOTE See 7.4.1 d), 7.4.1 e) and 7.4.1 f) for maintenance requirements and inspection activities. According to Clause 5 of EN ISO 12100:2010, 6.3, effective protection and guards shall be provided for moving and rotating parts if they are accessible and dangerous, in particular for: a) keys and screws in shafts; b) chains, belts; c) projecting motor shafts; d) speed governors not enclosed; e) step and pallet reversal in driving stations and/or return stations if these shall be entered for maintenance purposes; f) hand wheels and brake drums. g) gears, gear wheels, sprockets; h) projecting motor shafts; i) speed governors not enclosed; j) step and pallet reversal in driving stations and/or return stations if these shall be entered for maintenance purposes; k) hand wheels and brake drums.		3.6.2 The braking device arranged between the user side of the step and the return line shall be provided mechanical locking feature in this area, when there is a possibility that the step will move by its own weight during braking maintenance / operation inspection. 3.6.4 Regarding the high rise escalators and/or the long distance moving walkways, it shall be provided communication means between the operator of the main switch and other workers.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.8.2 Dimensions and equipment **5.8.2.1** In machinery spaces, especially in driving and return stations inside the truss, space with a sufficiently large standing area shall be kept free from permanently installed parts of any kind. The size of the standing area shall be at least 0,30 m2 and the smaller side shall be at least 0,50 m long. It is permitted to occupy this standing area by permanently installed parts, provided that the permanently installed parts are placed behind rounded corners of max. 0,25 m radius (see Figure 4) and at a height of at least 0,12 m above the free standing area.	No equivalent requirement.	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. **3.3.3 Comment** In machinery spaces, especially in driving and return stations inside the truss, it is recomended that the size of the standing area is at least 0,30 m^2 and the smaller side is at least 0,50 m long.
5.8.2.2 If the controller cabinet shall be moved or lifted for maintenance purposes, then suitable attachments for lifting shall be provided, e.g. eyebolts, handle.	No equivalent requirement.	No equivalent requirement.
5.8.2.3 Where the main drive or brake is arranged between the user side of the step, pallet or belt and the return line, a level standing area in the working zone of not less than 0,12 m2 shall be provided. The minimum dimension shall be not less than 0,30 m. This standing area is permitted to be fixed or removable. NOTE For machinery spaces, see also A.3.	No equivalent requirement.	No equivalent requirement.
No equivalent requirement.	No equivalent requirement.	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 3.3.2 If the depth of machinery space is greater than 1.5m, the equipment shall be provided for the maintenance person safely access

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.8.3 Lighting and socket outlets 5.8.3.1 The electric lighting and the socket outlets shall be independent of the power supply to the machine being fed either by a separate cable or a branch cable which is connected before the main switch of the escalator or moving walk. It shall be possible to break the supply of all phases by means of a separate switch (see 5.11.3.1).	No equivalent requirement.	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 3.2.3 The socket outlets shall be independent from the power supply or it shall be branched and supplied on the primary side of the main switch.
5.8.3.2 Electric lighting installations in driving and return stations and machinery spaces inside the truss shall be by means of a portable lamp permanently available in one of these places. One or more socket outlets shall be provided in each of these places. The light intensity shall be at least 200 lx in working areas.	**6.1.7.1/6.2.7.1** **6.1.7.1.1/6.2.7.1.1** **6.1.7.1.2/6.2.7.1.2**	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 3.2.1 The socket outlet for maintenance shall be installed at the free standing area of machinery spaces inside the truss. **3.2.2** (1) It shall be in driving and return stations. (2) If the drive unit, the brake unit, and the control unit are installed in a place different from 3.2.2 (1), the socket outlet shall be installed in each place. (3) It shall be provided at a position that the maintenance person can reach before entering the truss and driving and return stations.
5.8.3.3 Socket outlets shall be: a) either of type 2 P+PE (2 poles + earth conductor), 250 V, directly supplied by the mains, or b) of a type that is supplied at a safety extra low voltage in accordance with HD 60364-4-41:2007.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.9 Fire protection Fire protection and building requirements differ from country to country and so far neither have been harmonized. Therefore, this standard cannot include specific requirements for fire protection and building requirements. However, it is recommended that as far as possible, escalators and moving walks are made of materials that do not create an additional hazard in case of fire. To avoid any risk of fire, see also 5.2.1.4. Outer and inner decking, truss, pallets/steps, track system shall be at least class C according to EN 13501 1:2007+A1:2009, 11.5. For materials that are not generally classified a compliance test shall be undertaken according to EN 13501 1:2007+A1:2009 (SBI Test according EN 13823:2010+A1:2014[2]). For steps and pallets with plastic parts either on the tread surface or on the riser, this test shall be carried out with the step or pallet being in vertical position where the area with the plastic part are forming the test surface. In a configuration where a continuous arrangement of plastic inserts/parts exists in the direction of travel, a test according to EN 13501 1:2007+A1:2009 (SBI Test according to EN 13823:2010+A1:2014) shall be done solely with plastic insert material forming the whole test surface.	**6.1.1/6.2.1** **6.1.1.1/6.2.1.1.1** **6.1.2/6.2.2** **6.1.2.1/6.2.2.1** **6.1.3.5.1** **6.2.3.5.5** a) b)	**BSLJ (Elevator, escalator, and dumbwaiter) Article 34** **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.(2) In the BSLJ-EO; Article 129–12, item 2, the safety factor of step, frame, and truss or beam stipulated in BSLJ-EO; Article 129–4, item 2, paragraph 3 applied mutatis mutandis shall be not less than the value described in the following table. [see 2.4.2 Table 3] (a) Step shall be made by steel or other metals; (b) Truss shall be made by steel.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
NOTE A continuous arrangement is given for steps equipped with plastic inserts on the tread and on the riser and for pallets with plastic inserts in the direction of travel. Gaps between steps and pallets are not considered as an interruption of the continuous arrangement. If sprinklers or water mist systems are used their integration and fixation into the escalator and moving walk shall be done by taking into consideration the special needs of the machine.		
5.10 Transportation Complete escalators/moving walks or sub-assemblies or components of escalators/moving walks which cannot be handled by hand shall: a) either be equipped with fittings for movement by a lifting device or transportation means, or b) be designed in a way that such fittings can be attached (e.g. threaded holes), or c) be shaped in a way that the lifting device or transportation means can be attached easily.	No equivalent requirement.	No equivalent requirement.
5.11 Electric installations and appliances **5.11.1 General** **5.11.1.1 Introduction** The electric installation of escalators or moving walks shall be so designed and manufactured as to ensure protection against hazards arising from the electric equipment or which may be caused by external influences on it, provided the equipment is used in applications for which it was made and is adequately maintained.	**6.1.7.4/6.2.7.4** **6.1.7.4.1/6.2.7.4.1** **6.1.7.4.2/6.2.7.4.2**	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Therefore, the electric equipment shall: a) comply with the requirements stated in the CENELEC harmonized standards; b) where no harmonized standards as referred to in a) exist, comply with the requirements of the International Electrotechnical Commission (IEC) and which are stated in the CENELEC harmonized documents. Whenever one of these standards is used, its references are given, together with the limits within which it is used.		
5.11.1.2 Limits of application **5.11.1.2.1** The requirements of this standard relating to the installation and to the constituent components of the electric equipment apply: a) to the main switch of each independent power circuit (e.g. machine, heating system) of the escalator or moving walk and dependent circuits; b) to the switch for the lighting circuit of the escalator or moving walk and dependent circuits. The escalator or moving walk shall be considered as a whole, in the same way as a machine with its incorporated apparatus.	No equivalent requirement.	No equivalent requirement.
5.11.1.2.2 The electricity supply to the input terminals of the switches referred to in 5.11.1.2.1 and the electricity supply to the lighting of the machinery spaces, driving and return stations are not laid down by this standard.	No equivalent requirement.	No equivalent requirement.
5.11.1.2.3 The electromagnetic compatibility shall comply with the requirements of EN 12015:2014 and EN 12016:2013.	**6.1.7.4.3**	No equivalent requirement
5.11.1.3 Protection against direct contact. For protection against direct contact the requirements of EN 60204 1:2006, 6.2 shall apply	**6.1.7.4.1** (*ref. NFPA, Rule 620.4 and 620.71).*	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.11.1.4 Insulation resistance tests For resistance of the insulation between conductors and between conductors and the earth, EN 60204 1:2006, 18.3, shall apply.	**6.1.7.4.1** *(ref. NFPA, Rule 620.11(d).*	**JIS A 4302:2006;** Inspection standard of elevator, escalator, and dumbwaiter. 5.4.1 Inspection to be carried out in machinery room a) The insulation resistance shall comply with the provisions of Table 13 [see 2.4.2 Table 9] for each circuit. However, the insulation resistance may be inspected on each circuit which can be separated by switches or overcurrent circuit breakers.
5.11.1.5 Voltage limit for control and safety circuits For control and safety circuits, the value in direct current or the r.m.s. value in alternating current between conductors or between conductors and earth shall not exceed 250 V.	**6.1.7.4.1** *(ref. NFPA, Rule 620.3).*	Remarks: The service voltage of the circuit for the instantaneous-start fluorescent lamp (so-called slim- line lamp) used for lighting the sides of escalator, etc. shall be the primary (low voltage side) voltage.
5.11.1.6 Conductor for neutral and earth-continuity The conductor for neutral and earth continuity shall be in accordance with EN 60204 1:2006, Clause 8.	**NFPA 620–84.** Escalators, moving walks, wheelchair lifts, and stairway chair lifts shall comply with Article 250.	**TSEE-MO-1997;** Article 10: Ground of electrical equipment Article 11: Method of grounding electrical equipment **JEAC 8001-2016** Rule 1350-3: Requirements for method of grounding work 1350-15: Green indicator of ground line
5.11.2 Contactors, relay contactors, components of failsafe circuits **5.11.2.1 Contactors and relay contactors** **5.11.2.1.1** To stop the driving machine (see 5.12.3.5) the main contactors shall belong to the following categories as defined in EN 60947-4-1:2010): a) AC-3 for contactors of alternating current motors; b) DC-3 for contactors of direct current machines.	**6.1.6.15** **6.2.6.15**	**JIS C 8201-1:2007** Low-voltage switchgear and controlgear-Part 1: General rules. **JIS C 8201 = IEC 60947 (mod)**

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.11.2.1.2 Relay contactors (see 5.12.3.5) shall belong to the following categories as defined in EN 60947-5-1): a) AC-15 for contactors in alternating current control circuits; b) DC-13 for contactors in direct current control circuits.	No equivalent requirement.	No equivalent requirement.
5.11.2.1.3 For main contactors (see 5.11.2.1.1) it is permissible to assume, in the measures taken to comply with 5.12.1.2.2, that: — if one of the main contacts (normally open) is closed, all the normally closed mirror contacts (EN 60947-4-1:2010, Annex F) are open	**6.1.7.4.1** **6.2.7.4.1** *(ref. NFPA, Rule 620.3).*	No equivalent requirement.
5.11.2.1.4 For the relay contactors (see 5.11.2.1.2) and safety relays (see EN 50205), i. e. relays with forcibly guided (mechanically linked) contacts, it is permissible to assume, in the measures taken to comply with 5.12.1.2.2, that: a) if one of the normally closed contact is closed, all the normally open contacts are open (EN 60947-5-1); b) if one of the normally open contact is closed, all the normally closed contacts are open (EN 60947-5-1). NOTE: Auxiliary contacts used as separate block added to a main contactor or relay contactor are permitted only when fulfilling the requirements of EN 60947-5-1.	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	No equivalent requirement.
5.11.2.2 Components of failsafe circuits **5.11.2.2.1** When devices according to 5.11.2.1.2 are used as relays in a failsafe circuit, the assumptions of 5.11.2.1.3 also apply.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.11.2.2.2 If the relays used are such that the break and make contacts are never closed simultaneously for any position of the armature, the possibility of partial attraction of the armature is permitted to be disregarded (see 5.12.1.2.2 f).	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	No equivalent requirement.
5.11.2.2.3 Devices connected after safety devices shall meet the requirements of 5.12.2.6.1.3 with regard to the creep distances and air gaps (not with regard to the separation distances). This requirement does not apply to the devices mentioned in 5.11.2.1.	No equivalent requirement.	**JIS C 8201-1:2007** **Low-voltage switchgear and controlgear-Part 1: General rules** **JIS C 8201 = IEC 60947 (mod)**
5.11.3 Main switches **5.11.3.1** In the vicinity of the machine or in the return stations, or in the vicinity of the control devices, there shall be a main switch capable of breaking the supply to the motor, to the brake releasing device and to the control circuit in the live conductors. This switch shall not cut the supply to the socket outlets or to the lighting circuits necessary for inspection and maintenance (see 5.8.3). When separate supplies are provided for auxiliary equipment such as heating, balustrade lighting and comb lighting, it shall be possible to switch them off independently. The corresponding switches shall be located close to the main switch and be marked unambiguously.	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	**JIS A 4302:2006;** Inspection standard of elevator, escalator and dumbwaiter 5.1.1 Inspection to be carried out in machinery room b) Incoming panel, main switch, control board, conduit tube and wiring 1) The incoming panel and main switch shall be located near the machinery room entrance in principle and shall be capable of being safely and easily operated. 2) The control board and other control equipment shall be installed firmly, and provided with measures to prevent displacement and tumbling due to vibration of earthquake, etc. 3) The operation of contact points of every switch on the board shall be good.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		4) The insulation resistance of each circuit shall satisfy the requirements of Table 1 [see 2.4.2 Table 9]. The insulation resistance shall be capable of being inspected on each circuit divisible by switches or overcurrent breakers. **JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 3.1.1 The main switch shall be capable of breaking the supply to the motor, to the brake releasing device and to the control circuit in the live conductors. 3.1.2 The main switch shall be provided; (1) in the vicinity of the machine or in the return stations, or in the vicinity of the control devices. (2) at the position where the maintenance person can easily operate after opening the inspection door or cover. (3) when the main movable part such as the drive device, brake device etc. or the control device is installed in a place different from 3.1.2 (1), the switch equal to the main switch shall be installed also in the place.
5.11.3.2 The main switches as defined in 5.11.3.1 shall be capable of being locked or otherwise secured in the "isolated" position, with the use of a padlock or equivalent, to ensure no inadvertent operation by others (see EN 60204-1:2006, 5.3.3). The control mechanism of the main switch shall be easily and rapidly accessible after opening of the doors or trap doors.	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 3.1.3 Main switchgear shall be able to be distinguished the position of on/off by visual observation and shall be constructed so that the operator can not unintentionally operate it. JIS B 9960-1=IEC 60204-1 (mod.)
5.11.3.3 Main switches shall be capable of interrupting the highest current involved in normal operating conditions of the escalator or moving walk. They shall comply with the requirements of EN 60204-1:2006, Clause 5.	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.11.3.4 Where the main switches of several escalators or moving walks are positioned together it shall be possible to easily identify to which escalator or moving walk they refer.	No equivalent requirement.	No equivalent requirement.
5.11.4 Electric wiring **5.11.4.1 Conductors and cables** Conductors and cables shall be selected according to EN 60204 1:2006, Clause 12.	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	**JIS A 4302:2006;** Inspection standard of elevator, escalator, and dumbwaiter 5.4.1 Inspection to be carried out in machinery room. a) The insulation resistance shall comply with the provisions of Table 13 [see 2.4.2 Table 9] for each circuit. However, the insulation resistance may be inspected on each circuit which can be separated by switches or over-current circuit breakers. Remarks: The service voltage of the circuit for the instantaneous-start fluorescent lamp (so- slim-line lamp) used for lighting the sides of escalator, etc. shall be the primary (low voltage side) voltage. **JIS C 3301:2000;** Rubber insulated flexible cords. **JIS C 3306:2000;** Polyvinyl chloride insulated flexible cords. **JIS C 3307:2000;** 600V polyvinyl chloride insulated wires.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		JIS C 3316:2008; Electric polyvinyl chloride insulated wires for electrical apparatus. **JIS C 3317:2000;** 600V Grade heat-resistant polyvinyl chloride insulated wires. **JIS C 3327:2000;** 600V Rubber insulated flexible cables. **JIS C 3342:2012;** 600V Polyvinyl chloride insulated and sheathed cables. **JIS C 3401:2002**; Control cables. **JIS C 3408:2014;** Travelling cables for elevators. **JIS C 3652:1993;** Installation methods of power flat conductor cables.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		TSEE-MO-1997; Article 57 **Interpretation-TSEE-MO:2016 Article 172** Facilities of low voltage indoor wiring for elevators, dumbwaiters, and the like For low voltage indoor wiring, low voltage travelling cables, and low voltage indoor wiring that directly connects the above which are installed in hoistways of elevators, dumbwaiters, and the like, and whose working voltage is not exceeding 300 V, the cables for elevators corresponding to the following may be used: 1. their structures shall conform to the requirements of the item 4, “Materials, structures, and processing methods: of the Japanese Industrial Standard JIS C 3408 ”Travelling cables for elevators”. 2. their finished products shall conform to the requirements of the item 3, ”Characteristics“ when they are tested by the item 6, “Testing methods“ of the Japanese Industrial Standard JIS C 3408 ”Travelling cables for elevators“. **TSEE-MO-1997; Article 10, 11, 56, and 57** **Interpretation-TSEE-MO:2016 Article 185** Works for indoor discharge lamps (part 3) 8 When electrical wiring of lighting circuits (applicable to only wiring installed in an enclosure where possible for an inspection) installed in a dry place within escalators is enclosed in soft vinyl tubes, the wiring shall conform to the following:

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		a) fluorescent lamp electrical wires shall be used for electrical wires and every wire shall be installed in an independent soft vinyl tube (related to Ministerial Ordinance Article 57); b) soft vinyl tubes shall conform to the requirements of the item 6, "Testing" of the Japanese Industrial Standard JIS C 2415 (1994) "Extruded tubes for electrical insulation"; c) any joint of electrical wires except the joints with lead wires of the ballasts or those of the lamp sockets for discharge lamps shall not be made; d) metal structures which may touch electrical wires shall be grounded by the Class D grounding (related to Ministerial Ordinance Article 10 and Article 11). **MOC-N (No.1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below. **1.(2)** It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm].

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		(c) In case of equipped with fire shutter, the state when the shutter is about to close. **JEAS-B 407(2012)** Standard for interlocking suspension with fire shutter or fire door at escalator landing. **3.2 Contacts for interlocking** The contact for interlocking to be provided at the shutter shall be "b" contact and number of the contacts shall be same as number of escalators necessary to be interlocked. **JEAC 8001-2016** Rule 3220–8: Wiring of lighting circuits in escalators. All electrical wiring (applicable to only wiring installed in an enclosure where it is possible for an inspection) of lighting circuits in escalators which are installed in a dry place shall conform to the following.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		1) fluorescent lamp electrical wires shall be used for electrical wires and every wire shall be installed in an independent soft vinyl pipe; 2) The soft vinylpipe shall conform to the requirement of JIS C 2415 clause 6. 3) any joint of electrical wires except the joints with lead wires of the ballast or those of the lamp-sockets for discharge lamps shall not be made; 4) metal structures which may touch electrical wires shall be grounded by the Class D grounding. **JEAC 8001-2016** Rule 3305-14: Escalators. All electrical wiring installed in escalators shall conform to the following: 1) All electrical wiring in escalators shall be installed by metallic conduit wiring, synthetic resin tube wiring, metal raceway wiring, or cable wiring (excluding lead-covered cables of rubber insulation) except the cases corresponding to the following: a) a case where the wiring for short runs connecting the junction box to every mechanical apparatus is installed by flexible metal conduit tube wiring. Provided RB electrical wires (those of rubber insulation) shall not be used where electrical wires could be possibly damaged by oil; b) a case where wiring is installed by using chloroprene or vinyl armor sheathed cables for short runs connecting the junction box to every mechanical apparatus where electrical wires are not feared to be possibly damaged mechanically. 2) All electrical wiring shall be securely fastened to stationary structures so as not to be damaged by a possible contact to a movable structure.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		3) Sizes of electrical wires for wiring shall conform to the requirements of the item 6) of Rule 3305–13 “Elevators and dumbwaiters”. 4) An over-current breaker shall be provided for circuits branched from the main motor circuits according to the requirements of the item 9) of Rule 3305–13 “Elevators and dumbwaiters”. Rule 3305-13: Elevators and dumbwaiter 6) Sizes of electrical wires and travelling cables installed in hoistways and travelling body shall conform to the sizes listed in Table 3305-9. Table 3305–9 — Sizes of electrical wires and travelling cables for elevators and the like Type of wire: Conductor size Insulated wire, solid: 1,2 mm^2 or more Insulated wire, stranded: 1,4 mm^2 or more Cable, solid wire: 0,8 mm^2 or more Cable, stranded wire: 0.75mm^2 or more Travelling cable: 0,75 mm^2 or more Remark 1: Conductors with a size not less than 0,75 mm^2 may be used only for short runs connecting terminating piping boxes to mechanical apparatus for the wires with the mark of “*”. Remark 2: Solid wires with a diameter not less than 0,8 mm and less than 1,6 mm or stranded wires with a cross section not less than 0,75 mm^2 and less than 2 mm^2 with the mark of “**” may be used only for control or signal circuits when a device breaking an over-current and disconnecting it automatically from the electrical circuits in the event of an over-current.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		Remark 3: Concerning conductor sizes of travelling cables, three kinds of 0,75 mm^2, 1,4 mm^2, and 2,0 mm^2 are prescribed by the Japanese Industrial Standard JIS C 3408 "Travelling cables for elevators". 9) An over-current breaker shall be provided for a branched circuit (e.g. circuits for a micro motor, a cam motor, a door motor, lamps within hoistways, or the like control circuits or the similar circuits). Provided, for the circuits such as magnetic brake circuits where an over-current breaker is not recommendable to be provided, the above may be excluded. NOTE Concerning installation of an over-current breaker, see Rule 1360–9 "Rated current of an over-current breaker for protection of electrical wires". 10) For electrical wires connecting to resistors or the like whose temperature rise is not less than 60 °C, electrical wires of heat resistance property shall be used. Provided, insulated wires may be used, if a covering of a portion having excessive temperature rise is removed and the portion is covered by an insulator of heat resistance property or the portion is treated by inserting miniature porcelain bushings or the like.
5.11.4.2 Cross-sectional area of conductors To ensure adequate mechanical strength the cross-sectional area of conductors shall not be less than as shown in EN 60204 1:2006, Table 5	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.11.4.3 Wiring practices **5.11.4.3.1** The general requirements of EN 60204-1:2006, 13.1.1, 13.1.2 and 13.1.3, apply. **5.11.4.3.2** Conductors and cables shall be installed in conduits or trunkings or equivalent mechanical protection. Double insulated conductors and cables can be installed without conduits or trunkings if they are located as to avoid accidental damage, e.g. by moving parts	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	No equivalent requirement.
5.11.4.3.3 The requirement 5.11.4.3.2 needs not apply to: a) conductors or cables not connected to safety devices provided that: 1) they are not subject to a rated output of more than 100 VA, and; 2) they are part of SELV or PELV circuits; b) The wiring of operating or distribution devices in cabinets or on panels between: 1) different pieces of electric equipment, or 2) these pieces of equipment and the connection terminals.	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	No equivalent requirement.
5.11.4.3.4 If connections, connection terminals and connectors are not located in protective enclosure, their IP2X (EN 60529:1991) protection shall be maintained when connected and disconnected and they shall be properly fixed to prevent unintended disconnection.	**6.1.8.1.2** **6.1.8.1.2**	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.11.4.3.5 If, after opening of the main switch or switches of an escalator/moving walk, some connection terminals remain live and if the voltage exceeds 25 VAC or 60 VDC, a permanent warning label according to EN 60204-1:2006, Clause 16, shall be appropriately placed in proximity to the main switch or switches and a corresponding statement shall be included in the maintenance manual.	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 3.5 Electric shock prevention. 3.5.1 Even if the main switch is shut off, the connection terminal remain live, it shall be taken measures such as protecting with the cover or clearly indicating the danger with red mark/label.
5.11.4.3.6 Connection terminals whose accidental interconnection could lead to a dangerous malfunction of the escalator/moving walk shall be clearly separated unless their method of construction obviates this risk.	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	No equivalent requirement.
5.11.4.3.7 In order to ensure continuity of mechanical protection, the protective sheathing of conductors and cables shall fully enter the casings of switches and appliances, or shall terminate in a suitably constructed gland. However, if there is a risk of mechanical damage due to movement of parts or sharp edges of the frame itself, the conductors connected to the safety device shall be protected mechanically	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	No equivalent requirement.
5.11.4.4 Connectors Plug socket combinations shall comply with the requirements of EN 60204 1:2006, 13.4.5 except c), d) and i). Connectors and devices of the plug-in type placed in the circuits of electrical safety devices shall be so designed that it shall not be possible to insert them in a position which leads to a dangerous situation.	**6.1.7.4.1** **6.2.7.4.1** (ref. NFPA, Rule 620.3).	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12 Electric control system **5.12.1 Protective devices and functions** **5.12.1.1 Overview** Table 6 provides an overview of protective devices and functions to be regarded with reference to the corresponding clauses.	NOTE: These items contained in EN 115–1 Clause 5.12, except as specifically noted, are not addressed in A17.1/B44, Part VIII. Some of them will be a part of the next edition of the code and some are currently covered in the National Electrical Code, ANSI/ ASME 17.5/B44.1 and NFPA 70. **6.1.6.10.1/6.2.6.10.1**	**JEAC 8001-2016 and JIS A 4302:2006.**
5.12.1.2 Protection against electric faults **5.12.1.2.1** Any single fault listed in 5.12.1.2.2 in the electric equipment of an escalator or moving walk, if it cannot be excluded under conditions described in 5.12.1.2.3 and/or Annex B, shall not, on its own, be the cause of a dangerous situation of the escalator or moving walk.	**6.1.6.10.1/6.2.6.10.1** a) b) c) d) e) NOTE [6.1.6.10.1 (b) through (e)/6.2.6.9.1 (b) through (d)]: Requirements only apply to the circuits in which the devices are used and not the devices themselves.	No equivalent requirement.
No equivalent requirement.	**6.1.6.12/6.2.6.12**	No equivalent requirement.
No equivalent requirement.	**6.1.7.4.3/6.2.7.4.3**	No equivalent requirement.
5.12.1.2.2 The following faults shall be envisaged: a) absence of voltage; b) voltage drop; c) loss of continuity of a conductor; d) fault to earth of a circuit;	The items contained in EN 115–1 Clause 5.12.1.2.2 are not addressed in A17.1/B44, Part VIII. Some of them will be a part of the next edition of the code and some are currently covered in the National Electrical Code, ANSI/ ASME 17.5/B44.1 and NFPA 70. Methods used to satisfy **6.1.6.10.1/6.2.6.10.1** using software systems are permitted provided that a non-software- controlled means is also used to remove power from the driving- machine motor and brake.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
e) short circuit or open circuit, change of value or function in an electric component such as resistor, capacitor, transistor, lamp; f) non-attraction or incomplete attraction of the moving armature of a contactor or relay; g) non-separation of the moving armature of a contactor or relay; h) non-opening of a contact; i) non-closing of a contact; j) phase reversal.	**6.1.6.10.1/6.2.6.10.1** a) b) c) d) e) f) NOTE [6.1.6.10.1 (b) through (e)/6.2.6.9.1 (b) through (d)]: Requirements only apply to the circuits in which the devices are used and not the devices themselves. **6.1.6.10.3/6.2.6.10.3** **6.1.6.11** a) b) c) **6.1.6.13/6.2.6.13**	
5.12.1.2.3 The non-opening of a contact need not be considered in the case of safety switches conforming to 5.12.2.6.1.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.1.3 Protection of motors **5.12.1.3.1** Motors directly connected to the mains shall be protected against short-circuiting. **5.12.1.3.2** Motors directly connected to the mains shall be protected against overload by means of automatic circuit breakers with manual reset (except as provided for in 5.12.1.3.3) which shall cut off the supply to the motor in all live conductors (see EN 60947-4-1:2010)). **5.12.1.3.3** When the detection of overload operates on the basis of temperature increase in the windings of the motor, the protection device is permitted to close its contact automatically after sufficient cooling down has taken place. However, it shall only be possible to restart the escalator or moving walk under the conditions of 5.12.3.2. **5.12.1.3.4** The provisions of 5.12.1.3.2 and 5.12.1.3.3 apply to each winding if the motor has windings supplied by different circuits. **5.12.1.3.5** When the escalator or moving walk driving motors are supplied by DC generators driven by motors, the generator driving motors shall also be protected against overload	No equivalent requirement.	**TSEE-MO-1997; Article 65** **Interpretation-TSEE-MO:2016 Article 153** Facilities of overload protection device of motor For a motor equipped indoors in the event of an over-current, a device which automatically obstructs an over-current that may cause a motor to burn or an alarm device shall be provided. The article, however, shall not be applicable to any of the following cases. 1. A case of the motor equipped where the person in charge can always watch the motor during operation. 2. A case of the motor that has no risk to carry an over-current which may cause the motor to burn because of the motor structures or nature of a motor load. 3. A case of a single-phase motor where a rated current of the over-current breaker furnished on the line of the power source is not exceeding 15 A (20 A for a moulded- type circuit breaker). **JEAC 8001-2016** **Rule 3705-5: Facilities for** **overload protection device of motors and the like** 1. An overload protection device for a motor, such as a fuse, a moulded-case circuit-breaker, a thermal relay, an induction type relay, a static type relay, or the similar device for motor protection which is effective in preventing the motor from burning or an overload alarming device shall be provided. The article, however, shall not be applicable to any of the following cases (Interpretation-TSEE-MO Article 153). 1) The motor itself has an effective preventive device against overload burning.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		2) Even in case of a start failure, there is no risk of burning the motor due to a high impedance of a motor winding. NOTE An a. c. motor not exceeding 35 W or so generally corresponds to the above. 3) The person in charge always operates the motor like a general machine tool, a hoist, or the like. 4) There is no risk of overloading the motor because of a nature of a load. 5) A single-phase motor is supplied from the branched circuits of 15 A (20 A for a moulded-case circuit- breaker). 6) An output of the motor is not exceeding 0,2 kW. Remark 1 A fuse for the motor, which corresponds with the rated output or the rated current of the motor, shall be used. Remark 2 A fuse for the motor shall be provided at every pole as a general rule, but the fuse for the branched over-current breaker shown in Table 3705-2 [refer to the original material] may be used for the grounding side. Remark 3 The overload protection device for the motor shall be located as closely as possible to the motor. 2. For a motor which may fail to function or be damaged remarkably due to a phase failure of the power source, a protection device (an alarm device acceptable if no hitch) against the phase failure shall be provided for prevention of burning caused by the phase failure as a rule.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.1.4 Protection of safety devices The fault to earth of a circuit in which there is a safety device shall cause the immediate stopping of the driving machine.	No equivalent requirement.	No equivalent requirement.
5.12.1.5 Protection against electrostatic loading Means to discharge electrostatic loading shall be provided (e.g. anti-static-brushes).	No equivalent requirement.	No equivalent requirement.
5.12.2 Safety devices and functions **5.12.2.1 Overview** Table 7 provides an overview of requirements for the implementation of the safety circuit. NOTE The term device in the context with 5.12.2 represents both device and function.	No equivalent requirement.	**BSLJ-EO (Structure of escalator) Article 129–12** 5. The constructions of the preceding emergency stopping devices shall be the construction methods specified by the minister of land, infrastructure, and transport so as to have performance which operate automatically and enable to stop the steps safely with the deceleration in operating direction of not more than 1,25 m/s^2 when power supply fail, break down of driving devices, person or articles are caught, and in case of that persons are liable to be injured or articles are damaged, or the construction methods approved by the minister of land, infrastructure, and transport.
5.12.2.2 Function of safety devices The safety devices listed in Table 8 shall initiate a stop and prevent restarting according to 5.12.3.9. They shall consist of: a) either one or more safety switches satisfying 5.12.2.6.1, and/or b) failsafe circuits satisfying 5.12.2.6.2 considering failure exclusion of electronic components according to Annex B, and/or c) safety related electrical, electronic and programmable electronic devices (E/E/PE) in accordance with 5.12.2.6.3.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.2.3 Monitoring of safety devices No electric equipment shall be connected in parallel with a safety device with the exception of: a) safety devices in case of inspection control (5.12.3.13); b) connections to different points of the safety circuit for information about the status of safety devices; the devices used for that purpose shall fulfil the requirements of Annex B.	**6.1.6.10/6.2.6.10** a) b) c) d) e) NOTE [6.1.6.10.1 (b) through (e)/6.2.6.9.1 (b) through (d)]: Requirements only apply to the circuits in which the devices are used and not the devices themselves.	No equivalent requirement.
5.12.2.4 Power supply of safety devices The construction and arrangement of the internal power supply units shall be such as to prevent the appearance of false signals at the outputs of safety devices due to the effects of switching. In particular, voltage peaks arising from the operation of the escalator or moving walk or other equipment on the network shall not create inadmissible disturbances in electronic components (noise, immunity) in compliance with EN 12015:2014 and EN 12016:2013.	**6.1.6.11** a) b) c) **6.2.6.11**	No equivalent requirement.
5.12.2.5 Actuation of safety devices The components actuating the safety devices shall be selected and assembled so that they are able to function properly even under the mechanical stresses resulting from its continuous operation. Fixing elements for safety devices shall ensure the operation of the function by mechanical or geometric arrangements.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
In the case of redundancy type failsafe circuit, it shall be ensured by mechanical or geometric arrangements of the detecting elements that a mechanical fault cannot cause unnoticed loss of redundancy. Detecting elements of failsafe circuits shall fulfil the requirements of D.4.2 and D.4.3 if its malfunction is not detected.		
5.12.2.6 Means of safety devices **5.12.2.6.1** Safety switches **5.12.2.6.1.1** The operation of a safety switch shall be by positive mechanical separation of the contacts. This positive mechanical separation shall even occur if the contacts are welded together. Positive mechanical separation is achieved, when all contacts are brought to their open position in such a way that for a significant part of the travel there are no resilient elements (e.g. springs) between the moving contacts and the part of the actuator to which the actuating force is applied. The design shall be such as to minimize the risk of a short-circuit resulting from a faulty component.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.2.6.1.2 The safety switch shall be provided for a rated insulation voltage of 250 V if the enclosure provides a degree of protection of at least IP 4X (in accordance with EN 60529:1991), or 500 V if the degree of protection of the enclosure is less than IP 4X. Safety switches shall belong to the following categories as defined in EN 60947-5-1:2004,: a) AC-15 for safety switches in alternating current circuits; b) DC-13 for safety switches in direct current circuits. If the protective enclosure is not at least of type IP 4X the air gaps shall be at least 3 mm and creep distances at least 4 mm. After separation the distance for contacts shall be at least 4 mm. **5.12.2.6.1.4** In the case of multiple breaks, the individual distances for breaking contacts shall be at least 2 mm after separation. **5.12.2.6.1.5** Debris from the conductive material shall not lead to short-circuiting of contacts.		
5.12.2.6.2 Failsafe circuits 5.12.2.6.2.1 Anyone of the faults envisaged in 5.12.1.2 shall not be on its own the cause of a dangerous situation. **5.12.2.6.2.2** Furthermore, the following conditions apply for the faults envisaged in 5.12.1.2.2: If one fault combined with a second fault can lead to a dangerous situation, the escalator or moving walk shall be stopped by the time the next operating sequence takes place in which the faulty element should participate.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
The possibility of the second fault leading to a dangerous situation before the escalator or moving walk has been stopped by the sequence mentioned, is not considered. If the malfunction of the component which has caused the first fault cannot be detected by a change of state, appropriate measures shall ensure that the fault is detected and movement prevented at the latest when the escalator or moving walk is restarted according to 5.12.3.2. The MTBF (mean time between failures) of the fail-safe circuit shall be at least 2,5 years. This time was determined under the assumption that within a period of three months each escalator or each moving walk is restarted according to 5.12.3.2 at least once and, thus, is subject to a change of state. **5.12.2.6.2.3** If two faults combined with a third fault can lead to a dangerous situation, the escalator or moving walk shall be stopped by the time the next operating sequence takes place in which one of the faulty elements should participate. The possibility of the third fault leading to a dangerous situation before the escalator or moving walk has been stopped by the sequence mentioned, is not considered. If the malfunction of the components which have caused the two faults cannot be detected by a change of state, appropriate measures shall ensure that the faults are detected and movement is prevented at the latest when the escalator or moving walk is restarted according to 5.12.3.2. The MTBF (mean time between failures) of the fail-safe circuit shall be at least 2,5 years. This time was determined under the assumption that within a period of three months each escalator or each moving walk is restarted according to 5.12.3.2 at least once and, thus, is subject to a change of state.		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.2.6.2.4 A combination of more than three faults can be disregarded if: a) the failsafe circuit is built up of at least two channels, and their equal status is monitored by a control circuit. The control circuit shall be checked prior to a restart of the escalator or moving walk according to 5.12.3.2 (see also Annex C), or b) the failsafe circuit is built-up of at least three channels, and their equal status is monitored by a control circuit. If the requirements of a) or b) are not fulfilled, it is not permitted to interrupt the failure analysis but it shall be continued analogous to 5.12.2.6.2.3. For the implementation 5.11.2.2 shall be applied. **5.12.2.6.2.5** Drafting and assessing failsafe circuits shall be as shown in Figure C.1.		
5.12.2.6.3 Safety related electrical, electronic and programmable electronic devices (E/E/PE) Safety related electrical, electronic and programmable electronic devices (E/E/PE) shall be designed in accordance with the requirements of EN 62061:2005. If a E/E/PE and a non-safety related system share the same hardware, the requirements for E/E/PE shall be met.	No equivalent requirement.	No equivalent requirement.
5.12.2.7 Events to be detected by safety devices **5.12.2.7.1 Overview** Table 8 provides an overview of events to be detected by safety devices.	**6.1.6.3.4/6.2.6.3.4**	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
No equivalent requirement.	**6.1.6.3.6**	**MOC-N (No.1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below. 1.(1) It shall be that the braking devices are used for the escalators conforming to the standard described in BSLJ-EO; Article 129–12, paragraphs 3 to 5. 1.(2) It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm]. (d) A person or article is caught between a side of the step and skirt guard panels in the vicinity of landings.
5.12.2.7.2 Detection of excessive speed A device shall be provided to detect excessive speed before the speed exceeds a value of 1,2 times the nominal speed. It is permissible to disregard this requirement if the design prevents excessive speed.	**6.1.6.3.2** **6.2.6.3.2** a) b)	No equivalent requirement.
5.12.2.7.3 Detection of unintentional reversal of the direction of travel A device shall be provided for escalators and inclined ($\alpha \geq 6°$) moving walks to detect immediately the unintentional reversal of direction of travel.	**6.1.6.3.8/6.2.6.3.7**	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.2.7.4 Detection of closing of the auxiliary brake A device shall be provided to detect the non-lifting of the auxiliary brake after starting the escalator/moving walk (see 5.4.2.2).	No equivalent requirement.	No equivalent requirement.
5.12.2.7.5 Detection of breakage or undue elongation of the step/pallet chains A device shall be provided to detect the breakage or undue elongation of parts immediately driving the steps, pallets or the belt, e.g. chains or racks.	**6.1.6.3.3** a) b)	**MOC-N (No.1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below 1.(1) It shall be that the braking devices are used for the escalators conforming to the standard described in BSLJ-EO; Article 129–12, paragraphs 3 to 5. 1.(2) It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm]. (a) The extraordinary extension of the step chains.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.2.7.6 Detection of movement of tensioning device A device shall be provided to detect an unintended extension or reduction of the distance between the driving and tensioning devices of more than 20 mm (see 5.4.3.3 and 5.4.4.2).	**6.1.6.3.3** (a) (2)	**MOC-N (No. 1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below. **1.(2)** It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm]. **(a)** The extraordinary extension of the step chains. **JIS A 4302:2006;** Inspection standard of elevator, escalator, and dumbwaiter. 5.4.2 Inspection to be carried out un upper and lower landings and on steps. a) The installation of a stop switch that operates when the step chain abnormally elongates or breaks is strong, and the operation of a switch shall be reliable.
5.12.2.7.7 Detection of entrapment at comb A device shall be provided to detect objects being trapped which are not dealt with by the means described in 5.7.3.2.5.	**6.1.6.3.13/6.2.6.3.11** a) b)	No equivalent requirements.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.2.7.8 Detection of the stopping of a succeeding escalator or moving walk or detection of structural measures blocking the exit of the escalator or moving walk Stopping of a succeeding escalator or moving walk where an intermediate exit does not exist (see A.2.6) or the exit of the escalator or moving walk by structural measures is blocked (e.g. shutters, fire protection gates). See A.2.5 for additional stop device for emergency situation and definition of the exit area.	**6.1.6.3.7/6.2.6.3.6** **6.1.6.6/6.2.6.6**	**MOC-N (No.1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below. **1.(2)** It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm]. **(c)** In case of equipped with fire shutter the state when the shutter is about to close. **JEAS-B407 (2012)** Standard for interlocking suspension with fire shutter or fire door at escalator landings. **3.1 Interlocking suspension with fire shutter or fire door** (1) If a shutter facing with a landing of the escalator is located within 2 m (rated speed exceeding 30 m/min is 2.5 m) from the end of newel, the escalator is required to suspend operation interlocking with the shutter before the lower end of the fire shutter reaches 1.8 m from the floor level.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		(2) Regardless of the installation position of the fire door, the escalator shall detect that the door has started to close and shall stop automatically. (3) If the fire shutters or fire doors form an area and start closing at the same time, the escalator may be interlocked with any one of them. 3.2 Contacts for interlocking suspension (refer to Figure 2 and Figure 3). The contact for interlocking to be provided at the shutter shall be "b" contact and number of the contacts shall be same as number of escalators necessary to be interlocked. 3.3 Wiring (refer to Figure 2 and Figure 3). Lead-in wiring from a contact for interlocking suspension to the escalator machine room shall be passed outside of the escalator truss, but shall be separately installed for every escalator necessary to be interlocked. 3.4 Related matters (1) The fire shutter and fire door facing the landing of the escalator shall be located 1,2 m or more from the end of newel (In the case where a fixed guiding barriers are provided, the tip of the guiding barriers) to secure a flow line to the adjacent escalator.
5.12.2.7.9 Detection of entrapment at hand rail entry A device shall be provided to detect foreign bodies being trapped in the handrail entry (see 5.6.4.3).	**6.1.6.3.12** **6.2.6.3.10** a) b)	**MOC-N (No.1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below. 1.(1) It shall be that the braking devices are used for the escalators conforming to the standard described in BSLJ-EO; Article 129-12, paragraphs 3 to 5.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		1.(2) It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm]. (e) The person or the articles are caught in the inlet of the handrail.
5.12.2.7.10 Detection of sagging of step or pallet If any part of the step or pallet is sagging so that meshing of the combs is no longer ensured a safety device shall be provided. This safety device shall be arranged before each transition curve at a sufficient distance before the comb intersection line to ensure that the step or pallet which has sagged does not reach the comb intersection line (see stopping distances defined in 5.4.2.1.3.2 and 5.4.2.1.3.4). The safety device may be applied at any point of the step or pallet (see 5.7.2.5). This does not apply to belt moving walks.	**6.2.6.3.9** **6.1.6.3.11**	No equivalent requirement.
5.12.2.7.11 Detection of missing of step or pallet A missing step/pallet shall be detected and the escalator/moving walk stopped before the gap (resulting from the missing step/pallet) emerges from the comb. This shall be ensured by a safety device or function provided at each driving and return station in the return run of the steps/pallets. The installation of the detection means for this device is not permitted in the straight part between the transition curves as this is not part of driving or return station.	**6.1.6.5** **6.2.6.5** a) b)	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.2.7.12 Detection of non-lifting of the operational brake A device shall be provided to detect the non-lifting of the operational brake after starting the escalator/moving walk (see 5.4.2.1).	No equivalent requirement.	No equivalent requirement.
5.12.2.7.13 Detection of speed deviation of the hand rail A handrail speed monitoring device shall be provided and shall initiate the stopping of the escalator or moving walk in the event of a hand rail speed deviation of more than + 15 %/-15 % to the step/pallet speed within a time frame of 5 s to 15 s (see 5.6.1). It is permissible to disregard the requirement of + 15 % if the design prevents this situation condition.	**6.1.6.4/6.2.6.4**	**BSLJ-EO (Structure of escalator) Article 129–12** 1.(3) Escalators shall be provided with handrails at each side of steps (the portion going up and down on which the persons step). The upper surface of the handrails shall move in the same direction and at the same speed as the steps. [Notice of designing] When both or one of the left and right hand rails are stopped, it is recommended to install a device that stops the escalator automatically, and this device may have a function of detecting that the handrail is abnormally delayed from the step. If this device detects abnormality, the escalator shall not take into operation. **JIS A 4302:2006;** Inspection standard of elevator, escalator, and dumbwaiter. 5.4.2 Inspection to be carried out un upper and lower landings and on steps. d) A handrail shall be moved in the same direction and at substantially the same speed as the steps.
5.12.2.7.14 Detection of opened inspection cover A device shall be provided to detect opened inspection cover (see 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
5.12.2.7.15 Detection of the actuation of the stop device for emergency situations A device shall be provided to detect the actuation of a stop device for emergency. NOTE Devices according to EN ISO 13850:2015 do not support the functional requirement for stop devices according to 5.12.2.7.15. For the specific purpose of safety for escalators and moving walks the stop device for emergency situations is defined different to EN ISO 13850:2015	**6.1.6.3.1** **6.2.6.3.1** (c)	No equivalent requirement.
5.12.2.7.16 Detection of installed hand winding device A device shall be provided to detect the installation of a removable hand winding device (see 5.4.1.4).	No equivalent requirement.	No equivalent requirement.
5.12.2.7.17 Detection of the maintenance and repair stop device There shall be a stop device in the driving and return station. Escalators and moving walks with the driving unit arranged between the user side of the step, pallet or belt and the return line, or outside the return stations, shall have additional stop devices in the area of the driving unit. The stop devices shall be functionally in accordance with EN ISO 13850:2015. The position of the actuator of the stop device shall be marked clearly and permanently or the status of the safety contact shall be displayed clearly on the safety device SPECIFIC CASE: A stop device need not be provided in a machinery space if a main switch according to 5.11.3 is located therein. NOTE A stop device in accordance with emergency stop device defined in EN ISO 13850:2015 will comply to the requirement above.	**6.1.6.3.5** **6.2.6.3.5** a) b) c) d)	**JEAS-209 (2015)** Standard of the escalator structure for the maintenance and inspection. 3.1.2 The main switch shall be provided; (1) in the vicinity of the machine or in the return stations, or in the vicinity of the control devices. (3) When the main movable part such as the drive device, brake device etc. or the control device is installed in a place different from 3.1.2 (1), the switch equal to the main switch shall be installed also in the place. 3.4.3 COMMENT (1) The stop switch shall be installed in the machine room inside the truss and the space corresponding to 3.3.3.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.2.7.18 Detection of the actuation of the stop device on the inspection control device A device shall be provided to detect the actuation of the stop device on the inspection control device. The stop device shall: a) be operated manually; b) be in accordance with emergency stop device defined in EN ISO 13850:2015; This device is only active when the inspection control device is plugged in.		No equivalent requirement.
5.12.2.7.19 Detection of the absence/presence of a removable barrier intended to prevent access of shopping trolleys and baggage carts If the escalator/moving walk is required to operate in both directions and has facility for removable barriers in unrestricted area the absence/presence of these barriers shall be detected to prevent wrong positioning of the barrier resulting in operation towards the barrier (see also A.4). A device shall be provided to detect the removal of the barrier when the escalator/moving walk is running and the absence/presence of a removable barrier intended to prevent access of shopping trolleys and baggage carts and shall permit starting away from the inserted barrier. See A.2.5 for additional stop device for emergency situation and definition of the exit area.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.2.8 Function of failure lock When a failure is locked, starting shall be prevented for the electric control devices and functions mentioned in Table 8 and Table 9. NOTE Failure lock prevents from starting. Manual reset releases the failure lock. Safety devices (see Table 8 and Table 9), protective devices (see Table 6) and control devices (see Table 10) shall be provided with a failure lock where mentioned. Making available according Table 10, item A, shall be possible only after manual reset of the failure lock. It is not permitted to carry out a manual reset of the failure lock remotely. The manual reset of the failure lock shall be performed only by an authorized person. Before manual reset of the failure lock, the root cause for stopping shall be investigated, the stopping device shall be checked and corrective action shall be taken if necessary. The failure lock shall remain active in case of: a) even another following event of Table 6, Table 8 or Table 9 occurs; b) the reinstatement of the power supply or c) the change to or the return from inspection control. In inspection control it is permissible to enable/disable the safety devices according Table 8 and Table 9.	**6.1.6.14/6.2.6.14**	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.2.9 Function for detecting deviations of the electrical braking sequence See Table 9 — Requirements for detecting deviations of the electrical braking sequence 5.12.2.9.1 Detection of time deviations for the braking sequence for electrical braking A device shall be provided to detect the exceeding of the requirements of 5.12.3.5.2.2.2.	No equivalent requirement.	No equivalent requirement.
5.12.3 Control devices and functions **5.12.3.1 Overview** Table 10 provides an overview of control devices and functions.	**6.1.6/6.2.6** **6.1.6.1/6.2.6.1.1** **6.1.6.2/6.2.6.2** **6.1.6.2.1/6.2.6.2.1** a), 1), 2), 3) b) c) d)	No equivalent requirement.
5.12.3.2 Making available for use and starting – manually operated Making available for use and starting of the escalator/moving walk shall only be possible without users and be effected by one or more switches available to authorized persons only (e.g. key-operated switches, switches with detachable lever, switches under lockable protective caps, remote start devices) and be reachable from an area outside the comb intersection line. Such switches shall not function concurrently as main switches described in 5.11.3. The person who operates the switch shall be able to verify the step/pallet band is free of users and objects by visual or other means before making this operation. The direction of travel shall be distinctly recognizable from the indication on the switch.		**BSLJ-EO (Structure of escalator) Article 129–12, EXP. 4** [Notice of designing] Starting of the escalator shall be affected by key switches available to authorized persons only.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
The starting switch(es) shall be located within reach of the stop device according to 5.12.3.8. For remote starting devices the requirements above shall apply. NOTE See 7.4.1 d) for manual starting and 7.4.1 e) for the obligation to observe a complete revolution of the step/pallet band before making the escalator/moving walk available to the public after maintenance.		
5.12.3.3 Automatic operation – Starting in predetermined direction **5.12.3.3.1** Automatic operation shall only be possible after 5.12.3.2 applied. Escalators or moving walks which start or accelerate automatically by detecting the entering of a user shall move with at least 0,2 times the nominal speed when the user reaches the comb intersection line and then accelerate less than 0,5 m/s^2. The means for detecting the entering of a user shall take into account an average walking speed of 1 m/s. Constructional measures may be necessary to prevent circumvention of the detecting means. For the implementation of starting automatically (5.12.1.2 applies), the consequence of failures of the detection means actuating the automatic start at the entries (e.g. no or partly no detection of users) shall be prevented.OTE The intention of the above requirements is to detect a user entering the landings. Depending on the location of the detecting means the area to be regarded for detection may extend the landings (e.g. provision of traffic columns) or is smaller than the landings.	**6.1.6.1.1/6.2.6.1.2**	**JEAS-410B (2006)** Standard for automatic operation method of escalator 3.1 Automatic operation (1) When the stopped escalator detects passengers approaching at the entrance, it shall automatically start running and continue operation until the last passenger reaches the exit. (2) The running direction for the automatic operation shall be restricted to either upward or downward movement by the key operation. 3.2 The detecting point of the detection device The detecting point shall be placed at a point where the escalator starts moving and can reach to a stable speed prior to passengers getting on. It shall be located at a distance of 1,0 m or more from the turning end of the handrail or 1,7 m or more from the edge of the combs and shall be located at both the landing entrance and the exit (an example of the detection point is shown in Figure 1). 3.3 Prevention against the entering from the exit side

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.3.3.2 On escalators/ moving walks which start automatically by the entering of a user, the direction of travel shall be predetermined, clearly visible to the user and marked distinctly on the escalator/moving walk (see 7.2.2). In such cases where escalators or moving walks which start automatically by the entering of a user can be entered in the direction opposite its predetermined direction of travel, they shall start in the predetermined direction and conform to the requirements of 5.12.3.3.1. The moving time shall be not less than 10 s. 5.12.3.3.3 Following control requirements for users waiting on any of the landings apply — for the moving step/pallet band; or — in case the step/pallet band is stopped according to 5.12.3.7; 5.12.3.3.3.1 Requirement where the step/pallet band is moving Means shall be provided to detect any user on the landing. It shall provide a signal to the control system to keep the escalator/moving walk moving until the last user has left the landing or entered the moving step/pallet band. For stopping the requirements of 5.12.3.7 apply. 5.12.3.3.3.2 Requirements where the step/pallet band is stopped according to 5.12.3.7: When a user is about to enter the step/pallet band, detecting means shall be provided not more than 0.3 m before the comb intersection line providing control signal to the control system causing a) the termination of the automatic operation (5.12.3.3) and making the escalator/moving walk unavailable. Starting shall only apply according to 5.12.3.2; or		When the stopped escalator detects passengers approaching at the exit, it shall give them a warning, begin running in the predetermined direction for a fixed time, and show them that the escalator is not serviceable to prevent them from entering in the wrong direction. 3.4 Indications, instructions, and notices (1) At the entrance, it should be indicated that passengers are allowed to get on. (2) At the exit, it should be indicated that passengers are not allowed to get on. (3) The indications should be located at a place where the approaching passengers can see them easily.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
b) the reactivation for automatic start according to 5.12.3.12; or c) to initiate the start of the step band/pallets with an acceleration of not more than 0,3 m/s^2 NOTE The intention of the above requirements is to detect a user entering the landings. Depending on the location of the detecting means the area to be regarded for detection may extend the landings (e.g. provision of traffic columns) or is smaller than the landings.		
5.12.3.4 Automatic operation - Starting in 2-Direction-Mode **5.12.3.4.1** Automatic operation shall only be possible after 5.12.3.2 applied. Escalators which start automatically by detecting the entering of a user shall move with at least 0,2 times the nominal speed when the user reaches the comb intersection line and then accelerate less than 0,5 m/s^2. The means for detecting the entering of a user shall take into account an average walking speed for a walking person of 1 m/s. Constructional measures may be necessary to prevent circumvention of the detecting means. For the implementation of starting automatically (5.12.1.2 applies), the consequence of failures of the detection means actuating the automatic start at the entries (e.g. no or partly no detection of users) shall be prevented. 2-Direction-Mode is not permitted on moving walks. Note 1: The intention of above requirements is to detect a user is entering the landings. Depending on the location of the detecting means the area to be regarded for detection may extend the landings (e.g. provision of traffic columns) or is smaller than the landings.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Note 2: For escalators a traffic flow analysis has to be undertaken by the owner to establish this functionality can accommodate passenger volumes in both directions 5.12.3.4.2 On escalators which can start automatically in either direction (2-Direction-Mode) by the entering of a user, the operating mode shall be clearly visible to the user and marked distinctly on the escalator (see also 7.2.2). They shall start in the direction determined by the user entering first. When the escalator was started by a user from either direction, the indicator opposite from the initiated starting side shall automatically indicate “no entry” (see 7.2.1.2.3). 5.12.3.4.3 Following control requirements for users waiting on any of the landings apply: — For the moving step/pallet band; or — In case the step/pallet band is stopped according to 5.12.3.7. 5.12.3.4.3.1 Requirement where the step/pallet band is moving Means shall be provided to detect any user on the landing. It shall provide a signal to the control system to keep the escalator/moving walk moving until the last user has left the landing or entered the moving step/pallet band. For stopping the requirements of 5.12.3.7 apply. 5.12.3.4.3.2 Requirements where the step/pallet band is stopped according to 5.12.3.7:		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
When a user is about to enter the step/pallet band, detecting means shall be provided not more than 0.3m before the comb intersection line providing control signal to the control system causing a) the termination of the automatic operation (5.12.3.3) and making the escalator/moving walk unavailable. Starting shall only apply according to 5.12.3.2; or b) the reactivation for automatic start according to 5.12.3.12; or c) the start of the step/pallet band with an acceleration of not more than 0.3 m/s.		
For the implementation of starting automatically (5.12.1.2 applies), the consequence of failures of the detection means actuating the automatic start at the entries (e.g. no or partly no detection of users) shall be prevented. 2-Direction-Mode is not permitted on moving walks. NOTE 1 The intention of above requirements is to detect a user is entering the landings. Depending on the location of the detecting means the area to be regarded for detection may extend the landings (e.g. provision of traffic columns) or is smaller than the landings. NOTE 2 For escalators a traffic flow analysis has to be undertaken by the owner to establish this functionality can accommodate passenger volumes in both directions.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.3.4. On escalators which can start automatically in either direction (2-Direction-Mode) by the entering of a user, the operating mode shall be clearly visible to the user and marked distinctly on the escalator (see also 7.2.2). They shall start in the direction determined by the user entering first. When the escalator was started by a user from either direction, the indicator opposite from the initiated starting side shall automatically indicate "no entry" (see 7.2.1.2.3). 5.12.3.4.3 Following control requirements for users waiting on any of the landings apply: — for the moving step/pallet band; or — in case the step/pallet band is stopped according to 5.12.3.7. 5.12.3.4.3.1 Requirement where the step/pallet band is moving Means shall be provided to detect any user on the landing. It shall provide a signal to the control system to keep the escalator/moving walk moving until the last user has left the landing or entered the moving step/pallet band. For stopping the requirements of 5.12.3.7 apply.		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.3.4.3.2 Requirements where the step/pallet band is stopped according to 5.12.3.7: When a user is about to enter the step/pallet band, detecting means shall be provided not more than 0,3 m before the comb intersection line providing control signal to the control system causing a) the termination of the automatic operation (5.12.3.3) and making the escalator/moving walk unavailable. Starting shall only apply according to 5.12.3.2; or b) the reactivation for automatic start according to 5.12.3.12; or c) the start of the step/pallet band with an acceleration of not more than 0,3 m/ s^2.		
5.12.3.5 Stopping the escalator or moving walk **5.12.3.5.1 General** Stopping is regarded as the initiation of a braking sequence caused by protective, safety and control devices and functions. The stopping shall operate automatically: a) in the event of loss of the voltage supply; b) in the event of loss of the voltage supply to the control circuits. NOTE The interruption of a safety circuit is not considered as loss of voltage supply. The supply to the motor(s) shall be interrupted by at least two independent contactors, the contacts of which shall be in series in the supply circuit of the motor(s). If, when the escalator or moving walk is stopped, one of the main contacts of one of the contactors has not opened, restarting shall be prevented.	**6.1.6.10.4** **6.2.6.10.4** a), 1), 2) b) c) d) **6.1.6.15**	**MOC-N (No.1424–2000)** **1.** Based on the stipulation of the BSLJ-EO; Article 129–12, item 5, construction method of braking devices for the escalator is specified as follows. The structure of the braking devices for the escalator shall conform to each paragraph described below. **1.(2)** It shall be that the escalators are provided with devices to detect the situations described following (a) to (e). [except (d) for the escalator of which inclination is less than 15° and a difference in level between each adjacent steps (except the difference in level that the angle at the nose in the direction of movement of the higher level step is not more than 15°) is less than 4 mm]. **(b)** Loss of the power supply.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
The interruption of the electricity supply to the operational brake shall be effected by at least two independent electric devices. They can be those which break the supply to the motor(s). If after the stop of the escalator or moving walk one of these electric devices has not opened, restarting shall be prevented.		
5.12.3.5.2 Initiation of the braking sequence of the operational brake 5.12.3.5.2.1 General There shall be no intentional delay in the application of the operational braking system. If the control system starts a braking sequence immediately to bring the escalator/moving walk to a stop, this is not considered as an intentional delay. **5.12.3.5.2.2 Electrical braking** **5.12.3.5.2.2.1** Where electrical braking according to 5.4.2.1.1.2 is provided the interruption of the electricity supply of the electro-mechanical brake shall occur no later than 1 s after the specified electrical braking time is achieved after the initiation of the electrical braking sequence. 5.12.3.5.2.2.2 The total time for the defined electrical braking sequence until the actuation of the electro-mechanical brake shall not exceed 4 s. In case of the events 5.12.2.7.2, 5.12.2.7.3 and 5.12.2.9.2 the electrical braking sequence shall be terminated and the electro-mechanical brake shall be applied immediately.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.3.5.3 Initiation of the braking sequence by the auxiliary brake Auxiliary brakes shall become effective in either of the following conditions (See also 5.4.2.2.5): a) before the speed exceeds a value of 1,4 times the nominal speed; b) by the time the steps and pallets or the belt change from the present direction of motion.	No equivalent requirement.	No equivalent requirement.
5.12.3.6 Stopping and making unavailable by operator - manually operated Before stopping, the person shall have means of ensuring that nobody is using the escalator or moving walk, before making this operation. For remote stopping devices the same requirements apply.	No equivalent requirement.	**BSLJ-EO (Structure of escalator) Article 129–12, 4. EXP.** [Notice of designing] For remote stopping devices, the means of ensuring that nobody is using the escalator or moving walk before stopping should be provided.
5.12.3.7 Stopping - automatically operated It is permitted to design the control in such a way that the escalator or moving walk is stopped automatically after a sufficient time (at least the anticipated user transfer time plus 10 s) after the user has actuated a detection means described in 5.12.3.3 and 5.12.3.4.	**Comment:** Automatic starting and stopping will be allowed in A17.1/B44–2010 code revision onwards. A17.1/B44 – 2007 still has following requirement **6.1.6.1.1**	**JEAS-410B (2006)** Standard for automatic operation method of escalator 3.1 Automatic operation (1) When the stopped escalator detects passengers approaching at the entrance, it shall automatically start running and continue operation until the last passenger reaches the exit.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.3.8 Stopping by stop device for emergency situations, manually operated **5.12.3.8.1** Stop device for emergency situations shall be provided to stop the escalator or moving walks in the event of an emergency according to 5.12.2.7.15 when the actuator of the stop device has been activated. The actuator of the stop device shall be placed in conspicuous and easily reachable positions at least at or near each landing of the escalator or moving walk (see 7.2.1.2.2 for optical design). At the landings, the stop switches shall be reachable from an area outside the step/pallet band. If the stop switch is located below half the balustrade height h_1, in addition an indicator according to Figure 12 shall be placed on the inner side of the balustrade with the following characteristics: — a minimum diameter of 80 mm; — coloured red; — marked with “STOP” in white letters; — located above half the balustrade height h_1; — an arrow - which also may be located below half the balustrade height h_1.- pointing from the sign towards the stop device. The distances between stop devices for emergency situations shall not exceed: — 30 m on escalators; — 40 m on moving walks.	**6.1.6.3.1** **6.2.6.3.1** a), 1), 2)	**BSLJ-EO (Structure of escalator) Article 129–12** 4. Escalators shall be provided with the emergency stopping devices and devices to stop the ascending or the descending steps at the entrances and exits of the escalators. **JIS B 9703:2011 = ISO 13850:2006 (idt.)** Safety of machinery-Emergency stop-Principles for design 4.4.5 The actuator of the emergency stop device shall be red.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
If necessary, additional stop switches shall be provided to maintain the distance. For moving walks intended to transport shopping trolleys and baggage carts, see I.2. See Figure 12 for the illustration of the stop device indicator. NOTE Devices according to EN ISO 13850:2015 do not support the functional requirement for stop devices according to 5.12.3.8. For the specific purpose of safety for escalators and moving walks the stop switch for emergency situations is defined different to EN ISO 13850:2015		
5.12.3.9 Stopping initiated by protective and safety devices and functions All protection means in Table 6, items A, B, C and all detections means in Table 8 and Table 9 shall cause the stopping by operational brake according to 5.12.3.5.	No equivalent requirement.	No equivalent requirement.
5.12.3.10 Preventing from starting when permitted stopping distance exceeded A device shall be provided to prevent from starting in case the maximum permitted stopping distances (5.4.2.1.3.2 and 5.4.2.1.3.4) are exceeded by more than 20 %. Failure lock function according to 5.12.2.8 shall be provided.	No equivalent requirement.	No equivalent requirement.
5.12.3.11 Intended reversal of direction of travel An intended reversal of the direction of travel shall be possible only if the escalator or moving walk stands still and 5.12.3.2 applies.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.3.12 Reactivation for automatic restart Where stopping is effected by a stop switch for emergency situation according to 5.12.3.8, reactivation of the escalator or moving walk for automatic restart without the switches mentioned in 5.12.3.2 is permitted under the following conditions: a) The steps, pallets or the belt shall be supervised between the comb intersection lines and additional 0,30 m beyond each comb so that reactivation for automatic restart is effected only when there is no person or object within this zone. The device shall be able to detect an opaque upright standing cylinder with a diameter of 0,30 m and a height of 0,30 m at any place within this zone. b) The escalator or moving walk shall start by the entering of a user according to 5.12.3.3 and 5.12.3.4. Starting shall be effected only if, for a period of at least 10 s, the control device has not detected any persons or objects within the defined zone. c) The reactivation control initiated by the control device for automatic restart shall be a safety device according to 5.12.2. Self-controlling transmitter elements are permitted in single-channel design.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.3.13 Inspection control **5.12.3.13.1** Escalators or moving walks shall be equipped with inspection controls to permit operation during maintenance or repair or inspection by means of portable and manually operated control devices. At least one portable control device shall be provided for each escalator or moving walk. This device shall require at least continuous simultaneous actuation by the use of both hands, one hand on the direction-control-device and the other hand on the RUN-control-device, in order to activate and to maintain any operation of the escalator/moving walk. NOTE Simultaneous actuation is independent of any time lag between the initiation of each of the two control devices.	**6.1.6.3.15** **6.2.6.3.12** a) b) c) d) e) **6.1.6.2.2/6.2.6.2.2**	**JEAS-209 (2015)** Standard of the scalator structure necessary for the maintenance and inspection. 3.4.2 The function shall be provided that the self-holding circuit be separated and that the escalator be electrically operated under the effective safety circuit. COMMENT (1) The escalator shall be operable by the dedicated switch that is valid only for maintenance and inspection, or by connecting a dedicated operating device. When providing the dedicated switch, switch shall be protected against unintentional body contact. COMMENT (2)

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
5.12.3.13.2 For this purpose, one inspection outlet for the connection of the flexible cable of the portable manually operated control device shall be provided at least at each landing, e.g. in the driving station and the return station in the truss. The length of the cable shall be at least 3,00 m. Inspection outlets shall be located in such a way that any point of the escalator or moving walk can be reached with the cable. **5.12.3.13.3** The operating elements of this control device shall be protected against accidental operation. The escalator or moving walk is permitted to run only as long as the operating elements are switched on by permanent application of manual pressure. The direction of travel shall be distinctly recognizable from the indication on the switch. Each control device shall have a stop device according to 5.12.2.7.18. When the inspection control device is plugged in, the operation of the stop switch shall cause the disconnection of the power supply from the driving machine and the operational brake shall be activated. **5.12.3.13.4** When in inspection control, the inspection control device shall be the only means for starting the escalator or moving walk. All other starting devices shall be rendered inoperative. All inspection outlets shall be arranged in such a way that when more than one control device is connected, they all become inoperative for the starting of the escalator/moving walks (see Table 8 and Table 9 for safety devices remaining active in inspection control).		Escalator shall be operable by separating the self-holding circuit, and pushing the button of the dedicated switch or continuing to press the button of the dedicated operation device. The button shall be protected against accidental operation and it shall be indicated the direction of travel. COMMENT (3) The safety circuit provided for the escalator shall be effective to ensure safety operation during maintenance / inspection. COMMENT (4) When it is necessary to invalidate the safety circuit at the time of maintenance / inspection, the safety circuit shall be individually invalidated, not all at once. The button shall be protected against accidental operation and it shall indicate the direction of travel.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
6 Verification of the safety requirements and/or protective measures **6.1 General** Table 11 indicates the methods by which the safety requirements and measures described in Clause 5 shall be verified by the manufacturer for each new model of escalator/moving walk, together with a reference to the corresponding sub-clauses in this standard. Secondary sub-clauses, which are not listed in the table, are verified as part of the quoted sub-clause. All verification records shall be kept by the manufacturer. Where mechanical testing is required in accordance with this standard, setting tolerances are permitted.	No equivalent requirement.	No equivalent requirement.
6.2 Specific data, test reports and certificates The following documentation should be held by the manufacturer: a) stress analysis of the truss or equivalent certificate by a stress analyst; b) proof by calculation of sufficient breakage resistance of the parts directly driving the steps, pallets or the belt, e.g. step chains, racks; c) calculation of the stopping distances for loaded moving walks (see 5.4.2.1.3.4) together with adjustment data;	**8.3.6** **8.3.6.1** a) b) **8.3.6.2** **8.3.6.3** **8.3.6.4**	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
d) proof testing of steps or pallets; e) proof of the breaking strength of the step chain/pallet chain/belt; f) proof of sliding coefficients for skirting; g) proof of anti-slip properties of tread surfaces (steps, pallets, floor and comb plates without combs); h) proof of stopping distances and deceleration values; i) proof of electromagnetic compatibility.		
7 Information for use **7.1 General** All escalators and moving walks are required to be provided with documentation that shall include an instruction handbook relating to use, maintenance, inspection, periodic checks and rescue operations. All information for use shall be in accordance with EN ISO 12100:2010, 6.4, and also contain additional provisions for the use of machines within the scope of the standard. Information for use shall cover, separately or in combination, transport, assembly and installation, commissioning, use (setting, teaching/programming, operation, cleaning, fault finding and maintenance) of the escalator and moving walk, and, if necessary, de-commissioning, dismantling and disposal.	**8.6**	**JEAS-2007(2017)** **Standard for making of escalator instruction manual** **I. Basic principle for making of escalator instruction manual** 1 About contents of instruction manual (1) It shall be expressed without giving misunderstanding to the owner, administrator, user, and maintenance inspection person (expert engineer). (2) It shall be effective information for owner or administrator to understand its role. (3) It shall be effective information including technical matters so that the owner or administrator can safely operate the escalator. (4) It shall be described the items if there are matters or prohibitions to be communicated to the owner or manager as a manufacturer.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		2. Operation of Instruction Manual At the time of hand over the escalator, the manufacturer surely provides the instruction manual to the owner and inform the owner the following items. (1) The owner should understand the contents of the instruction manual and use it for daily operation management, maintenance, inspection and statutory inspection. (2) The owner keeps the instruction manual securely. (3) The owner shall take over the instruction manual to the next owner or manager when the owner or manager changes.
7.2 Signals and warning devices **7.2.1 Plates, inscriptions and notices for use** **7.2.1.1 General** All signs, inscriptions and notices for use shall be of durable material, placed in a conspicuous position and written in clearly legible characters in the language of the country where the escalator or moving walk is in operation. **7.2.1.2 Safety signs near the entrances of escalators or moving walks** **7.2.1.2.1** The following mandatory action signs and prohibition signs for the user shall be fixed in the vicinity of the entrances:	**6.1.6.9** **6.1.6.9.1/6.2.6.9.1/6.1.6.9.2/6.2.6.9.2**	**JEAS-2007 (2017)** **Standard for making of escalator instruction manual** **IV. 1 Operation control** 2. Warning signs and cautions Sticker for attention (a) Prohibition of hang out of handrail (b) Prohibition to put a stroller (c) Prohibition of playing around the escalator (d) Prohibition of walking on the escalator (e) Be careful not to get caught clothes or boots etc (f) Stand within the yellow lines

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
a) "Small children shall be held firmly" (see Figure G.1); b) "Dogs shall be carried" (see Figure G.2); c) "Use the handrail" (see Figure G.3, Reg. Nr. ISO 7010 M012); d) "Push chairs not permitted" (see Figure G.4). When required by local conditions, prohibition signs, e.g. "Transportation of bulky and heavy loads not permitted" and mandatory action signs like "use permitted only with footwear" or "for safety reasons, wheelchair users are advised to use the lift" will possibly be necessary.		
7.2.1.2.2 Stop devices referred to in 5.12.3.8 shall be coloured red and either on the device itself or in its immediate vicinity be marked with the inscription "STOP". The indicator mentioned in 5.12.3.8.1 is not considered to fulfill this requirement.	**6.1.6.3.1/6.2.6.3.1**	**BSLJ-EO (Structure of escalator) Article 129–12** **4.** Escalators shall be provided with the emergency stopping devices and devices to stop the ascending or the descending steps at the entrances and exits of the escalators. **EXP. [Notice of designing]** Abuse protection guard should be provided for avoiding falling of the passenger by emergency stopping, additionally its location should be easy to recognize for easy operation when emergency.
7.2.1.2.3 During maintenance, repair, inspection or similar work, the access to the escalator or moving walk shall be barred to unauthorized persons by devices: — which shall bear the notice "No Access", or — the "No Entry" indicator (prohibition sign C,1a as described in the "Convention on Road Signs and Signals" and be available in immediate area.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
7.2.1.3 Instructions for hand winding devices If a hand winding device is provided, operating instructions for use shall be available in the vicinity. The direction of travel of the escalator or moving walk shall be indicated clearly.	No equivalent requirement.	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 3.6 Prevention of pinching and catching 3.6.3 Appropriate instructions on use shall be indicated to the equipment required for manual operation.
7.2.1.4 Notices on the access doors to machinery spaces outside the truss, driving and return stations On access doors to machinery spaces outside the truss, driving and return stations, a notice shall be fixed with the inscription: "Machinery space - danger, access prohibited to unauthorized persons".	No equivalent requirement.	No equivalent requirement.
7.2.2 Special indicators for escalators and moving walks starting automatically In the case of escalators or moving walks starting automatically (see 5.12.3.3 and 5.12.3.4), a clearly visible signal system, e.g. road traffic signals, shall be provided indicating to the user whether the escalator or moving walk is available for use, and its direction of travel. The automatic operation in 2-Direction-Mode (5.12.3.4) requires an additional indication for this operation (e.g. sign for two-way-traffic).	No equivalent requirement.	**JEAS-410B (2006)** Standard for automatic operation method of escalator 3.4 Indications, instructions, and notices (1) At the entrance, it should be indicated that passengers are allowed to get on (an example is shown in Figure 2.). (2) At the exit, it should be indicated that passengers are not allowed to get on (an example is shown in Figure 3). (3) The indications should be located at a place where the approaching passengers can see them easily.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
7.3 Inspection and test **7.3.1 General** Escalators and moving walks shall be inspected before their first use.	**8.10.4**	**BSLJ (Inspection on completion of buildings)** Article 7-1 BSLJ (Completion of inspection by officials designated by the minister of land, infrastructure, and transport) Article 7–2 BSLJ (Intermediate inspection on buildings) **Article 7–3** BSLJ (Intermediate inspection by the official designated by minister of land, infrastructure, and transport or others) **Article 7–4** BSLJ (Special issue no inspection of buildings) **Article 7–5** BSLJ (Restriction on use of building up to obtaining the certificate of inspection) **Article 7–6** The Building Standard Law Enforcement Regulation, Article 6

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
7.3.2 Constructional inspection and acceptance inspection and test The constructional inspection and acceptance inspection and test shall be carried out at the job-site on completion of the escalator or moving walk. For the constructional inspection and acceptance inspection and test, the data specified in 6.2 should form part of a pre-completed test sheet. Furthermore, layout drawings, description of the equipment and wiring diagrams (current flow chart with legend or explanations, and a terminal connection chart) which permit a check of compliance with the safety requirements specified in this standard, shall be provided. The constructional inspection comprises the examination of the completed installation for conformity with the required data and with regard to proper workmanship as specified in this standard. The acceptance inspection and test comprises: a) overall visual inspection; b) functional test; c) test of electric safety devices with regard to their effective operation; d) test of the brake(s) of the escalator or moving walk under no load, for compliance with the prescribed stopping distances (see 5.4.2.1.3.2 and 5.4.2.1.3.4). An examination of the brake adjustment according to the calculation required in 6.2 c) is also necessary. Additionally, for escalators, a test of the stopping distances under brake load (see 5.4.2.1.3.2) is required unless the stopping distances can be verified by other methods;	**8.10**	**JIS A 4302:2006;** Inspection standard of elevator, escalator, and dumbwaiter. **3. Inspection items** **3.1 Completion inspection** In the completion inspection, the elevator, etc. are inspected in compliance with every item given in the design documents and also for all the items provided in 5. **JEAS-A1003 (2014)** Escalator specifications **JEAS-1004B (2002)** **Structural calculation for escalators** **JEAS-A1021B (2015)** Report of escalator conditions form after work completion

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
e) measurement of the insulation resistance of the different circuits between conductors and earth (see 5.11.1.4). For this measurement, the electronic components shall be disconnected. This needs to include a test of the electric continuity of the connection between the earth terminal(s) in the driving station and the different parts of the escalator or moving walk liable to be live accidentally.		
No equivalent requirement	**8.11**	**JIS A 4302:2006;** Inspection standard of elevator, escalator, and dumbwaiter **3. Inspection items** **3.2 Periodic inspection** In the periodic inspection for maintenance and care, inspection is made for all the items provided in 5, except the loading test.
7.4 Accompanying documents (in particular, instruction handbook) **7.4.1 Contents** The instruction handbook (e.g. in accordance with EN 13015:2001+A1:2008) or other written instructions shall contain among others: a) information relating to transport, handling and storage of the escalator or moving walk, e.g.:	**8.6.1.2** **8.6.1.2.1** **8.6.1.2.2** **8.6.1.3** **8.6.1.4** **8.6.1.4.1**	**JEAS-2007 (2017)** Standard for creation of escalator instruction manual.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— storage conditions; — dimensions, mass value(s), position of the centre(s) of gravity; — indications for handling (e.g. drawings indicating application points for lifting equipment); b) information relating to installation and commissioning of the escalator or moving walk, e.g.: — building interfaces (see Annex A); — fixing / anchoring and vibration dampening requirements; — assembly and mounting conditions; — space needed for use and maintenance; — permissible environmental conditions (e.g. temperature, moisture, vibration, electromagnetic radiation, earthquake and civil defence); — instructions for connecting to the power supply (particularly about protection against electric overloading); — advice about waste removal/disposal; — if necessary, recommendations about protective measures which shall be taken by the owner; e.g. additional safeguards (see EN ISO 12100:2010, Figure 2, Footnote d)), safety distances, safety signs and signals; c) information relating to the escalator or moving walk itself, e.g.: — detailed description of the escalator or moving walk, its fittings, its guards and/or protective devices; — comprehensive range of applications for which the escalator or moving walk is intended, including prohibited usages, if any, taking into account variations of the original machine if appropriate;		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— diagrams (especially schematic representation of safety functions and layout details); — technical documentation about electric equipment (see EN 60204 series[4]); — documents attesting that the escalator or moving walk complies with the relevant directives; — documents specifying the grade of the slip resistance; d) information relating to the use of the escalator or moving walk, e.g. about: — manual starting (e.g. necessity to check of step, pallet, landings for absence of persons and goods); — intended use; — preventing arrangements in the vicinity of the escalator/moving walk which encourages misuse; — keeping free of unrestricted areas (see A.2.5);		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— particular risks which may be generated by certain applications (including the use of shopping trolleys and/or baggage carts on escalators and moving walks, see Annex I), and about specific safe measures which are necessary for such applications; — reasonably foreseeable misuse and prohibited usages; — recommendation to not use escalators as regular staircases or emergency exits; — recommendation that, for escalators and moving walks which otherwise would be exposed to weather conditions, the customer provides a roof or enclosure; — fault identification and location, repair, and restarting after an intervention; — investigations and necessary corrective actions in case of faults requiring manual reset, to be taken before reset and restart; e) information for maintenance, e.g.: — necessity to follow the maintenance instructions given in the instruction handbook; — personal protective equipment which need to be used and training required; — nature and frequency of inspections; — instructions relating to maintenance operations which require a definite technical knowledge or particular skills and hence should be carried out exclusively by skilled persons (e.g. maintenance staff, specialists); — instructions relating to maintenance actions (e.g. replacement of parts) which do not require specific skills and hence may be carried out by the owner;		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— drawings and diagrams (e.g. wiring and schematic diagrams) enabling maintenance personnel to carry out their task rationally (especially fault-finding tasks); — instructions relating to cleaning and refurbishment; — necessity to observe a complete revolution of the step/pallet band before making the escalator/moving walk available to the public after maintenance; — instructions on the necessary use of inspection controls during maintenance and repair work; f) information about periodic inspection and tests to ascertain whether the escalator or moving walk is safe in operation, including: — electric safety devices with regard to their effective operation; — brake(s) according to 7.3.2 d); — driving elements for visible signs of wear and tear and for insufficient tension of belts and chains; — steps, pallets or the belt for defects, true run and guidance; — dimensions and tolerances specified in this standard; — combs for proper condition and adjustment; — interior panel and the skirting; — handrails; — test of the electric continuity of the connection between the earth terminal(s) in the driving station and the different parts of the escalator or moving walk liable to be live accidentally; g) information for emergency situations, e.g.:		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— the operating method to be followed in the event of accident or breakdown; — use of hand winding device, if any (see 5.4.1.4 and 7.2.1.3); — warning about possible emission or leakage of harmful substance(s), and if possible indication of means to fight their effects; — for escalators and moving walks subject to seismic conditions, instructions describing the behaviour of the unit in the event of earthquake and the need to maintain and to periodically test that the seismic equipment is in working order, and instructions that after seismic event the safe operating ability of the escalator or moving walk shall be checked; h) a declaration that the emission sound pressure level measured under free field conditions at a distance of 1,00 m from the surface of the machinery and at a height of 1,60 m from the floor plate is expected not to exceed 70 dB(A).		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— description of manual controls (actuators); — setting and adjustment; — risks which could not be eliminated by the protective measures taken by the designer; — interdiction to place merchandise between adjacent balustrades or between a balustrade and adjacent building structures; — preventing arrangements in the vicinity of the escalator/moving walk which encourages mis-use; — keeping free of unrestricted areas (see A.2.5); — particular risks which may be generated by certain applications (including the use of shopping trolleys and/or baggage carts on escalators and moving walks, see Annex I), and about specific safe measures which are necessary for such applications;	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— reasonably foreseeable misuse and prohibited usages; — recommendation to not use escalators as regular staircases or emergency exits; — recommendation that, for escalators and moving walks which otherwise would be exposed to weather conditions, the customer provides a roof or enclosure; — fault identification and location, repair, and restarting after an intervention; — investigations and necessary corrective actions in case of faults requiring manual reset, to be taken before reset and restart; e) information for maintenance, e.g.: — necessity to follow the maintenance instructions given in the instruction handbook; — personal protective equipment which need to be used and training required; — nature and frequency of inspections; — instructions relating to maintenance operations which require a definite technical knowledge or particular skills and hence should be carried out exclusively by skilled persons (e.g. maintenance staff, specialists); — instructions relating to maintenance actions (e.g. replacement of parts) which do not require specific skills and hence may be carried out by the owner; — drawings and diagrams (e.g. wiring and schematic diagrams) enabling maintenance personnel to carry out their task rationally (especially fault-finding tasks); — instructions relating to cleaning and refurbishment;		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— necessity to observe a complete revolution of the step/pallet band before making the escalator/moving walk available to the public after maintenance; — instructions on the necessary use of inspection controls during maintenance and repair work; f) information about periodic inspection and tests to ascertain whether the escalator or moving walk is safe in operation, including: — electric safety and control devices with regard to their effective operation; — brake(s) according to 7.3.2 d); — driving elements for visible signs of wear and tear and for insufficient tension of belts and chains; — steps, pallets or the belt for defects, true run and guidance; — dimensions and tolerances specified in this standard; — combs for proper condition and adjustment; — interior panel and the skirting; — handrails; — test of the electric continuity of the connection between the earth terminal(s) in the driving station and the different parts of the escalator or moving walk liable to be live accidentally; g) information for emergency situations, e.g.: — the operating method to be followed in the event of accident or breakdown;		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— use of hand winding device, if any (see 5.4.1.4 and 7.2.1.3); — warning about possible emission or leakage of harmful substance(s), and if possible indication of means to fight their effects; — for escalators and moving walks subject to seismic conditions, instructions describing the behaviour of the unit in the event of earthquake and the need to maintain and to periodically test that the seismic equipment is in working order, and instructions that after seismic event the safe operating ability of the escalator or moving walk shall be checked; h) a declaration that the emission sound pressure level measured under free field conditions at a distance of 1,00 m from the surface of the machinery and at a height of 1,60 m from the floor plate is expected not to exceed 70 dB(A).		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
7.4.2 Presentation of the instruction handbook a) Type and size of print shall ensure the best possible legibility. Warning signs and/or cautions should be emphasized by the use of colours, symbols and/or large print. b) Information for use shall be given in the language(s) of the country in which the escalator or moving walk will be used for the first time and in the original version. If more than one language shall be used, each language should be readily distinguished from the other(s), and efforts should be made to keep the translated text and the relevant illustration together. c) Whenever helpful to the understanding, text should be supported by illustrations. Illustrations should be supplemented with written details enabling, for instance, manual controls (actuators) to be located and identified; they should not be separated from the accompanying text and should follow sequential operations. d) Consideration should be given to presenting information in tabular form where this will aid understanding. Tables should be adjacent to the relevant text. e) The use of colours should be considered, particularly in relation to components requiring quick identification. f) When information for use is lengthy, a table of contents and/or an index should be given. g) Safety-relevant instructions which involve immediate action should be provided in a form readily available to the operator.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
7.4.3 Advice for drafting and editing information for use a) The information shall clearly relate to the specific model of escalator or moving walk. b) When information for use is being prepared, the communication process "see – think – use" should be followed in order to achieve the maximum effect and should follow sequential operations. The questions "how?" and "why?" should be anticipated and the answers provided. c) Information for use shall be as simple and as brief as possible and should be expressed in consistent terms and units with a clear explanation of unusual technical terms. d) Documents giving instructions for use should be produced in durable form (i.e. they should be able to survive frequent handling). It may be useful to mark them "keep for future reference". Where information for use is kept in electronic form (e.g. CD, DVD, tape) information on safety-related issues that need immediate action shall always be backed up with a hard copy that is readily available.	No equivalent requirement.	No equivalent requirement.
7.5 Marking At least at one landing, the — name and full address of the manufacturer and, where applicable, his authorized representative; — designation of series or type of the machinery; — serial number; — year of construction (year in which the manufacturing process is completed) shall be indicated, visible from the outside.	**8.6.1.5** **8.6.1.5.1** **8.6.1.5.2** **8.9.1** **8.9.2** **8.9.3**	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Annex A **(normative)** **Building interfaces** **A.1 General** The requirements in in the following chapters are important for the safety of users and maintenance personal. If it is not possible for the manufacturers of the escalator or moving walk to fulfill these requirements (or some of them) due to the fact that e.g. they are not installing the escalator or moving walk, those requirements that are not fulfilled shall be part of the instruction handbook as an obligation for the owner (see 7.4).	No equivalent requirement.	No equivalent requirement.
A.2 Free space for users **A.2.1** The clear height above the steps of the escalator or pallets or belt of the moving walk including the area to the end of the newel and the unrestricted area at all points shall be not less than 2,30 m (see h4 in Figures 5 and A.1).	**6.1.3.12/6.2.3.15**	**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.** n) Where dangerous pillars, beams, etc. are located within 2,1 m in vertical distance above the steps. **JEAS -422 (2013)** **Standard for the safety measure in surroundings and supervision of escalator/moving walk** **3.1.2 Obstacles adjacent to the escalator and moving walk** On the walls etc. adjacent to the escalator/moving walk, partially protruding obstacles (advertisements, lighting fixtures, piping, partition columns, projected walls, etc.) shall not be furnished within a range of 2,100 mm vertically from the nose line of the steps and 500 mm horizontally from the outer face of the handrails [see 2.4.1 Figure 4].

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
A.2.2 To prevent collision, a minimum free area around the escalator or moving walk is defined as per Figure A.1. The clear height h4 can be reduced outside of the handrail to the height h12, which measured from the steps of the escalator or the pallets or the belt of the moving walk shall be at least 2,10 m. The distance between the outer edge of the handrail and walls or other obstacles (see b10 in Figure A.1) shall under no circumstances be less than 80 mm horizontally and 25 mm vertically below the lower edge of the handrail (see b_{12} in Figure 6). The area is permitted to be smaller, if by appropriate measures, the risk of injury is minimized.	**6.1.3.2.2/6.2.3.2.3**	No equivalent requirement.
A.2.3 For escalators and moving walks arranged adjacent to one another either parallel or criss-cross, the distance between the handrails shall be not less than 160 mm (see b_{11} in Figure A.1).	No equivalent requirement.	No equivalent requirement.
A.2.4 Where building obstacles can cause injuries, appropriate preventive measures shall be taken. In particular, at floor intersections and on criss-cross escalators or moving walks, a vertical deflector of not less than 0,30 m in height, not presenting any sharp cutting edges, shall be mounted rigidly above the handrail level and extend at least 25 mm below the lower edge of the handrail, e.g. as an imperforate triangle (see h5 in Figures 5 and 7). It is not necessary to comply with these requirements when the distance b9 between the outer edge of the handrail and any obstacle is equal to or greater than 400 mm (see Figure A.1).	**6.1.3.3.11/6.2.3.3.7**	**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.(3) When the horizontal distance between the outer side of handrail and any obstacle which intersects and close to that outer side of handrail, e.g. the building ceiling, building beam etc. or the lower surface of the adjacent escalator is not greater than 50 cm, a wedge guard should be furnished as follows [see 2.4.1 Figure 7]. (a) The wedge guards should be furnished at lower side of the obstacle.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		(b) The thickness of the wedge guard end should be equal to or greater than 6 mm with no sharp edge. The wedge guard should have construction of the length with which the wedge guard reaches at 20 cm or more, vertically lower than upper surface of the handrail. (c) The wedge guard surface should not differ in rank with the obstacle surface facing the escalator. **EXP.1.** (3) (Paragraph 1) .... The wedge guard should be furnished stationary. (Paragraph 2) .... If the wedge guard could not be fixed on the obstacle because of its construction, the wedge guard might be suspended firmly from the ceiling or beam etc. and its lower side might be fixed to the escalator with chain etc. without big difference in rank with the obstacle surface facing the escalator. (Paragraph 4) Vertical surface of the stationary wedge guard facing the escalator is specified not to differ in rank with the obstacle surface facing the escalator. However, it may project at the dimension about a thickness of the wedge guard board or its metal fitting. (Paragraph 5) The wedge guard is not required when the obstacle is vertical pillar etc. with no sharp edge. **EXP. [Notice of designing]** **2. Wedge guard**

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		(1) The stationary wedge guard is effective for preventing the passenger's head from being caught, and its height over the handrail should not be less than 30 cm. (2) The front end of the stationary wedge guard may be a cylinder of 50 mm or more in diameter. (3) It is recommended that a movable wedge guard is furnished in front of the stationary wedge guard to warn the passenger leaning over the handrail of approaching the stationary wedge guard.
No equivalent requirement.	No equivalent requirement.	**JEAS -422 (2013)** Standard for surroundings and supervision of escalator/moving walk 3.1.4 Falling prevention net and falling object prevention board When there is some clearance or space of 200 mm or more between the two adjacent escalators/moving walks or between the escalator/ moving walk and the opening of the building floor etc., safety nets etc. which do not allow the ball of 50 mm in diameter pass through shall be furnished at every other floor to catch the falling personal belongings of the passengers etc. for preventing injury due to the falling articles. Frameworks of the safety nets etc. shall be made of steel or the like and shall be fixed firmly.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
A.2.5 At the exit(s) of each individual escalator or moving walk a sufficient unrestricted area shall be available to accommodate persons. The width of the unrestricted area shall at least correspond to the distance between the outer edges of the handrails plus 80 mm on each side. The depth shall be at least 2,50 m measured from the end of the balustrade. It shall be permissible to reduce it to 2,00 m if the width of the unrestricted area is increased to at least double the distance between the outer edges of the handrails plus 80 mm on each side. These are the minimum permitted dimensions that shall be applied in all conditions assuming that this unrestricted area is not affected by e.g. other passenger flows within the building. NOTE For guiding barriers and traffic columns, see A.5. An overlapping of unrestricted areas is not permitted. A lateral shift of the unrestricted area is permitted. The floor of the unrestricted area shall be flat. A maximum inclination of 6° is permissible. Fixed stairs inside the unrestricted areas are not permitted. Where the exit of the escalator or moving walk is blocked by structural measures (e.g. shutters, fire protection gates, removable barriers) or in the case that there is no sufficient exit between succeeding escalators/moving walks, an additional stop switch for emergency situations shall be provided:	**6.1.3.6.4/6.2.3.8.4**	**MOC-N (No. 1417–2000)** **EXP. 2** [Notice of designing] Escalator of which rated speed exceeding 30m/min and not more than 45m/min should take the following (1) to (3) measures for the stable position of passenger. **(3)** Distance from the edge of handrail return section to the obstacle along the step direction at the landing shall be 2.5m or more for avoiding the jam of passengers. For the escalator installed in the platform of station, whose landing is in the vicinity of platform edge, guide fence to protect passengers should be equipped.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
a) within reach from inside the escalator/moving walk. b) within a distance between 2,00 m and 3,00 m before the step/pallet/belt reaches the comb intersection line; c) within a vertical range of 200 mm below and 400 mm above the handrails measured from the top of the handrail to the middle of the actuator (e.g. push button or handle). Assemblies in the inside or outside of the balustrade are permitted when they are arranged and formed in such a manner as to eliminate any risk of harm caused by trapping (taking into account 5.5.2.4, A.2.2 and A.5).		
No equivalent requirements.	**6.1.3.6.3/6.2.3.8.3**	No equivalent requirement.
A.2.6 In the case of successive escalators and moving walks without intermediate exits, they shall have the same capacity. A safety device according to 5.12.2.7.8 shall be provided.	**6.1.6.6**	No equivalent requirement.
A.2.7 Where it is possible for people to come into contact with the outer edge of a handrail at a landing and can be drawn into a hazardous situation, such as toppling over a balustrade, appropriate preventative measures shall be taken (for an example, see Figure A.2). Some examples are: — prevention of entry into the space by the placement of permanent barriers; — increasing the height of the building structure of the fixed balustrade in the hazard area by at least 100 mm above the handrail level and positioned between 80 mm and 120 mm from the outer edge of the handrail.	Defined by applicable building code.	**JEAS-422 (2013)** Standard for surroundings and supervision of escalator/moving walk 3.1.3 **Fences for prevention of falling down, barriers for prevention of obstacles falling and a partition plate preventing the children from coming in by mistake** When there is some clearance or space between the escalator/moving walk and the opening of the building floor, fences for prevention of falling down and barriers for prevention of obstacles falling shall be furnished. At a place facing the entrance or the exit of the escalator, a partition plate shall be furnished to prevent the children from coming in by mistake (Refer to Figure 4). [see 2.4.1 Figure 5.1, Figure 5.2 and Figure 6].

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
A.2.8 The surrounds of the escalator or moving walk shall be illuminated, especially in the vicinity of the combs. Information should be exchanged between the manufacturer and the customer.	**6.1.7.2/6.2.7.2**	No equivalent requirement.
A.2.9 It is permissible to arrange the lighting in the surrounding space and/or at the installation itself. The intensity of illumination at the landings including the combs shall be related to the intensity of illumination of the general lighting in the area. The intensity of illumination shall be not less than 50 lx at the comb intersection line measured at floor level.	**6.1.7.2/6.2.7.2**	No equivalent requirement.
A.3 Machinery spaces outside the truss **A.3.1** A safe access for persons to machinery spaces shall be provided.	No equivalent requirements.	No equivalent requirement.
A.3.2 Machinery spaces shall be lockable and only accessible to authorized persons.	**6.1.7.3.2**	No equivalent requirement.
A.3.3 Machinery spaces shall be provided with permanently installed electric lighting on the following basis: a) a minimum of 200 lx at floor level in working areas; b) a minimum of 50 lx at floor level in access routes leading to these working areas.	**6.1.7.1.1/6.2.7.1.1**	No equivalent requirement.
A.3.4 Emergency lighting shall be installed to allow the safe evacuation of all personnel working in any machinery space. NOTE Emergency lighting is not intended for continuation of maintenance or other activities.	This is defined in building codes and NFPA.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
A.3.5 The dimensions of machinery spaces shall be sufficient to permit easy and safe working on equipment, especially the electrical equipment. In particular there shall be provided at least a clear height of 2,00 m at working areas, and: a) a clear horizontal area in front of the control panels and the cabinets. This area is defined as follows: 1) depth, measured from the external surface of the enclosures: at least 0,70 m; 2) width, the greater of the following values: 0,50 m or the full width of the cabinet or panel; b) a clear horizontal area of at least 0,50 m x 0,60 m for maintenance and inspection of moving parts at points where this is necessary.	**This is defined in A.17.5 and NFPA 70**	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 4. Control device located in machinery spaces outside the truss 4.2 Structure of the machinery spaces outside the truss 4.2.1 Appropriate working space shall be provided in accordance with clause 3.3.3 to prevent hindrance or danger to operation of the escalator and maintenance / inspection work of the control device. The rear or the side of control panel which does not involve inspection of the equipment and replacement of parts is not required the working space. 4.2.2 The clear height from floor level to the ceiling or to the lower end of the beam shall be at least 2 m. 4.2.3 The ventilation equipment (ventilation fan, louver etc.) commensurate with the calorific value of the equipment shall be provided to keep room temperature below 40 degrees. 4.2.4 The access way to the machinery spaces outside the truss shall have width at least 0.7 m and height at least 1.8 m and lockable door. 4.2.5 Machinery space shall be provided indoor electric lighting. The lighting switch shall be located near the entrance. 4.2.6 Machinary space shall be provided the outlet. 4.2.7 Machinery space outside the truss shall be lockable. It shall be able to unlock from the inside of machinery space without a key.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
A.3.6 The clear height for movement shall not be less than 1,80 m. The access ways to the clear spaces mentioned in A.3.6 shall have a width of at least 0,50 m. This value may be reduced to 0,40 m where there are no moving parts. This full height for movement is taken to the underside of the structural roof beams and measured from both: a) the floor of the access area; b) the floor of the working area.	No equivalent requirement.	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 4. Control device located in machinery spaces outside the truss 4.3 The structure of access way to the machinery spaces outside the truss. 4.3.1 If passing through machine room of other equipment, the access way shall have width at least 0.7 m and height at least 1.8 m. 4.3.2 Machinery space shall be provided suitable electric lighting. 4.3.3 The stairs leading to the machinery space shall be no more than 230 mm height, with a tread surface of at least 150 mm depth and with a handrail (with side wall: at least 950mm, without side wall: at least 1 100 mm).
A.3.7 In machinery spaces the clear height shall under no circumstances be less than 2,00 m.	No equivalent requirement.	No equivalent requirement.
No equivalent requirements.	**6.1.3.15** **2.2.2.4**	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
No equivalent requirement.	No equivalent requirement.	**JEAS-209 (2015)** Standard of the escalator structure necessary for the maintenance and inspection. 4. Control device located in machinery spaces outside the truss. 4.1 Prevention of pinching and catching 4.1.1 The power supply shall be pulled in to the main machine room, and the main circuit breaker specified in 3.1 which opens the power circuit shall be provided in the main machine room. 4.1.2 The functions that can be inspected operation by electric power shall not be installed in the machinery spaces outside the truss. 4.1.3 It shall be provided communication means between the workers of the machinery spaces outside the truss and the workers of the escalator side.
A.4 Measures to prevent access of shopping trolleys and baggage carts **A.4.1 General** If there is a reasonable foreseeable risk that shopping trolleys and/or baggage carts can be taken onto escalators or moving walks, adequate measures shall be taken to eliminate risks and access shall be prevented if the following conditions are given: a) for escalators: where shopping trolleys or baggage carts are available in the area around. b) for escalators: where shopping trolleys or baggage carts are in an area not close to the escalator where it is reasonably foreseeable that they are taken onto the escalator.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
c) for moving walks: where shopping trolleys or baggage carts are not intended to be used on a moving walk. NOTE It´s in the responsibility of the owner to define the width of the trolleys, that it´s ensured that the trolleys can´t fit through between balustrade and barrier.		
A.4.2 Barriers If barriers are used, the following requirements shall be fulfilled: a) The barrier shall be installed at the entrance only. An installation at the exit is not permitted in the unrestricted area. b) The design of the barrier shall not create another risk. c) The free entrance width between ends of the newels and barriers – and between barriers itself - shall be at least 500 mm and less than the width of the type of shopping trolley or baggage cart which will be used. d) The height of the barrier shall be between 900 mm and 1 100 mm. e) The barrier and its fixation shall withstand the following load: At a height of 200 mm a horizontal force of 3 000 N applies. NOTE: This force results from an impact of a chassis of a shopping trolley (according to EN 1929 1[5]) /baggage cart loaded with 160 kg moving with a speed of 1,00 m/s. f) The barrier shall be fixed preferably at the building structures. It is also permitted to fix it at the floor plate. In that case, when the defined forces apply, there shall be no permanent deformation and increased/additional gaps.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
A.5 Fixed guiding barriers and traffic columns Where fixed guiding barriers and/or traffic columns (including e.g. control devices and stop devices for emergency situations) are necessary in the unrestricted area, their design shall not create another risk. The following requirements shall be met: a) The guiding barriers or traffic columns shall have a minimum horizontal distance (radius) of 500 mm to any point of the handrail and shall be positioned outside of the centre line of the handrail (see placement A in Figure A.3). b) The minimum horizontal distance (radius) to any point of the handrail may be reduced to 300 mm, provided that the guiding barriers or traffic columns are positioned outside of the centre lines of the handrails and an additional barrier is installed between the guiding barriers or traffic columns and the vertical centre line of the balustrade newel (see placement B in Figure A.3). The additional barrier shall have a lateral distance between 80 mm to 120 mm of the handrail outer edge and shall close at least the area between the actual lowest point of the handrail entry into the newel and the balustrade decking profile and shall have filled inlets with gaps < 25 mm (see Figure A.3). c) The minimum horizontal distance (radius) to any point of the handrail may be reduced to 180 mm, provided that the guiding barrier or traffic column is positioned outside of the outer edge of the handrail and an additional barrier is installed between the guiding barrier or traffic column and the vertical centre line of the balustrade newel (see placement C in Figure A.3).	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
The additional barrier shall have a lateral distance between 80 mm to 120 mm of the handrail outer edge and shall close at least the area between the actual lowest point of the handrail entry into the newel and the balustrade decking profile and shall have filled inlets with gaps < 25 mm (see Figure A.3). d) The minimum horizontal distance (radius) to any point of the handrail may be reduced to 100 mm, provided that the guiding barrier or traffic column is of a round shape and is positioned outside of the outer edge of the handrail and an additional barrier is installed between the guiding barrier or traffic column and the vertical centre line of the balustrade newel (see placement D in Figure A.3). The additional barrier shall have a lateral distance between 80 mm to 120 mm of the handrail outer edge and shall close at least the area between the actual lowest point of the handrail entry into the newel and the balustrade decking profile and shall have filled inlets with gaps < 25 mm (see Figure A.3) In addition, the following specific requirements apply: a) The guiding barriers and traffic columns and their fixation shall withstand a horizontal force of 1 kN/m applied to the top of the device. b) The guiding barriers and traffic columns shall be fixed preferably at the building structures. It is also permitted to fix it at the floor plate. In that case, when the defined forces apply, there shall be no permanent deformation and increased/additional gaps.		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
c) The height of traffic columns shall be at least the height of the handrail level. d) The height of guiding barriers shall be at least the height of the balustrade decking. e) If guiding barriers and traffic columns are placed inside the unrestricted area, the size of the unrestricted area shall remain the same and in this case be extended in the length. f) Guiding barriers and traffic columns are not considered as structural measures that block the exit. For guiding barriers and traffic columns in the immediate environment of the unrestricted area these requirements also apply. For other devices/installations outside the unrestricted area in the immediate environment requirements a), b), c) and d) apply.		
A.6 Electric power supply Agreements shall be made between the owner and the manufacturer about electric supply and electric protection requirements (e.g. electric shock, short circuit; overload). The installation shall comply with a) EN 60204 1:2006, or b) with the requirements of the national rules of the country where it is installed.	**6.1.7.4.1 / 6.2.7.4.1** refer to NFPA 70 or CSA-C22.1	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Annex B – Electronic components – failure exclusion **(normative)** **B.1 Scope** 5.12.1 envisages a number of faults of the electric equipment of the escalator and moving walk. During the failure analysis, some faults can be excluded under certain conditions. This annex describes these conditions and gives the requirements for fulfilling them.	No equivalent requirement.	No equivalent requirement.
B.2 Failure exclusions – conditions Table B.1 shows: a) a list of the major and most usual components used in present electronic technology; the components have been grouped by "families": 1) passive components 1; 2) semiconductors 2; 3) miscellaneous 3; 4) assembled printed circuits 4; b) a number of identified failures: 5) interruption I; 6) short-circuit II; 7) change value to higher value III; 8) change value to lower value IV; 9) change of function V;	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
c) the possibility and conditions of failure exclusion: The first condition for failure exclusion is that components shall always be used within their own worst case limits, even in the worst case conditions specified by the standards, in the field of temperature, humidity, voltage and vibrations. d) some remarks. In the table: — the "NO" in the cell means: failure not excluded, i.e. shall be considered; — the unmarked cell means: the identified fault type is not relevant. A design guide line for safety circuits is given in Annex E.		
Annex C **(normative)** **Drafting and assessing failsafe circuits** See Figure C.1	No equivalent requirement.	No equivalent requirement.
Annex D **(normative)** **Testing of failsafe circuits containing electronic components and/or safety related electrical, electronic and programmable electronic devices (E/E/PE)** **D.1 General**	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
D.2.1 Failsafe circuits containing electronic components The applicant shall indicate to the laboratory: a) the identification on the board; b) working conditions; c) listing of used components; d) layout of the printed circuit board; e) layout of the hybrids and marks of the tracks used in failsafe circuits; f) function description; g) electric data inclusive wiring diagram, if applicable, including input and output definitions of the board		
D.2.2 Safety related electrical, electronic and programmable electronic devices (E/E/PE) In addition to D.2.1 the following documentation shall be provided: documents and descriptions relating to the common measures for the design and implementation process; general description of the software used (e.g. programming rules, language, compiler, modules); function description including software architecture and hardware/software interaction; description of blocks, modules, data, variables and interfaces; software listings.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
D.3 Test sample There shall be submitted to the laboratory: b) one printed circuit board and c) one printed circuit board bare (without components).	No equivalent requirement.	No equivalent requirement.
D.4 Mechanical test **D.4.1 General** During the tests, the tested object (printed circuit) shall be kept under operation. During and after the tests, no unsafe operation and condition shall appear within the failsafe circuit. **D.4.2 Vibrations** Transmitter elements of failsafe circuits shall withstand the requirements of: a) EN 60068-2-6:2008, A.6.1, Table C.2 (Endurance by sweeping): 20 sweep cycles in each axis: 1) at amplitude 0,35 mm or 5 gn ; and 2) in the frequency range 10 Hz to 55 Hz; and also of: b) EN 60068-2-27:2009, 4.1, Table 1 (acceleration and duration of pulse) in the combination of: 3) 1 pulse in each axis with a peak acceleration 294 m/s^2 or 30 g_n;	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
4) corresponding duration of pulse 11 ms; and 5) corresponding velocity change 2,1 m/s half sine. NOTE Where shock absorbers for transmitter elements are fitted, they are considered as part of the transmitter elements. After tests, clearances and creeping distances shall not become smaller than the minimum accepted. **D.4.3 Bumping** **D.4.3.1 General** Bumping tests shall simulate the cases when printed circuits fall, introducing the risk of rupture of components and unsafe situation. These tests shall be carried out according to EN 60068-2-27:2009. Tests are divided into the partial test shocking, and continuous shocking. During the tests, the operation of the circuit is not required.		
D.4.3.2 Partial test shocking The test object shall satisfy the following minimum requirements: a) Shocking shapes 1 pulse in each axis (half-sinus); b) Amplitude of acceleration 15 g_n; c) Duration of shock 11 ms.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
D.4.3.3 Continous shocking The test object shall satisfy the following minimum requirements: a) Amplitude of acceleration 10 g_n; b) Duration of shock 16 ms; c) 1) Number of shocks 1 000 ± 10; 2) Shock frequency 2/s.	No equivalent requirement.	No equivalent requirement.
D.5 Climatic stress testing **D.5.1 Temperature tests** Temperature tests shall be carried out according to EN 60068-2-14:2009 as follows:	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
a) Operating ambient limits: 0 °C, + 65 °C (ambient temperature of the electric safety device in the control panel); b) Test conditions: 1) The printed circuit board shall be in operational position. 2) The printed circuit board shall be supplied with normally rated voltage. 3) The electric safety device shall operate during and after the test. If the printed circuit board includes components other than failsafe circuits, they also shall operate during the test (their failure is not considered). 4) Tests will be carried out for minimum and maximum temperature (0 °C, + 65 °C); tests will last a minimum of 4 h. 5) If the printed circuit board shall be used to operate within wider temperature limits, it shall be tested for these values.		
D.5.2 Hunidity test Humidity tests are not necessary for failsafe circuits as the pollution degree for escalators/moving walks is supposed to be class 3 according to EN 60664-1:2007, and the relative creeping distances and clearances are specified in this standard.	No equivalent requirement.	No equivalent requirement.
D.6 Functional and safety test of E/E/PE Functional and safety tests for E/E/PE shall be performed according to EN 62061:2005.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Annex E **(informative)** **Design guideline for safety circuits** This design guide-line gives recommendations to avoid dangerous situations in the case when information is collected from the safety circuit for control purposes, for remote control, alarm control, etc. Some dangerous situations are recognized coming from the possibility of bridging one or several electric safety devices by short circuiting or by local interruption of common lead (earth) combined with one or several other failures. It is good practice to follow the recommendations given below: — Design the board and circuits with distances in accordance with specifications 3.1 and 3.6 of Table B.1. — Organize common lead so that the common lead for the control of the escalator/moving walk comes behind the electronic components. Any rupture will cause a non-operation of the control (danger exists that changes in wiring occur during the life of the escalator/moving walk). — Make always calculations about the “worst case” condition. — Always use outside (out of element) resistors as protective devices of input elements; internal resistor of the device should not be considered as safe. — Use only components according to listed specifications. — Consider backwards voltage coming from electronics. Using galvanically separated circuits can solve the problems in some cases.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— Design electric installations in accordance with HD 60364-5-54:2011[6]. — The "worst case" calculation cannot be avoided, whatever the design. If modifications or add-ons are made after the installation of the escalator/moving walk, the "worst case" calculation, involving new and existing equipment, shall be carried out again — Some failure exclusions can be accepted, according to Table B.1. — Failures outside the environment of the escalator/moving walk need not be taken into consideration. — "An interruption of the earth from the main supply of the building to the controller collection earth bar (rail) can be excluded, providing the installation is made in accordance with HD 60364-5-54:2011."		
Annex F **(informative)** **Examples of possible dynamic torsional tests for steps and pallets** **F.1 General** The following examples illustrate practical methods for carrying out dynamic torsional tests as required by 5.3.3.3.1.2 and 5.3.2.3.2.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
F.2 Torsional test 1 The step/pallet is 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 is supported and fixed via the step/pallet chains. In order to minimize the influence of the rollers on the deformation, all rollers supporting the step are replaced by steel rollers with the same main dimensions. Furthermore the supporting trailer roller is able to move with low friction on the supporting plane to allow also transverse movement. To avoid the lift off of the step/pallet roller opposite to the unsupported free trailer roller mentioned below, it has a locking clamp parallel to the supporting area with a clearance less than 0,2 mm (see Figure F.1, for test equipment). In order to enable the torsioning of the step/pallet, one trailer roller is not supported or is left out. In addition the centre of this trailer roller is able to move downward from 0 to – 4 mm, moving in an arc whose centre is the step/pallet chain roller centre. This 4 mm displacement is related to a trailer roller to step/pallet chain roller centre distance of 400 mm. This ratio is also maintained, when the 400 mm dimension is varied. A dynamic load is applied perpendicular to the tread surface on a steel plate arranged as specified in 5.3.3.2.1 and 5.3.3.2.3 respectively, in the centre of the tread surface, which leads to the deflection at the unsupported or left out trailer roller.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
F.3 Torsional test 2 The step/pallet assembly is mounted by its chain axle and by one end of the trailer wheel axle, as shown in Figure F.2, below (no wheels are fitted for this test). The chain axle is supported at the position normally occupied by the step/pallet chain. The step/pallet is free to rotate about, but not to slide along, the chain axle. The 'fixed' end of the trailer wheel axle is held at the journal by a ball-jointed arm, to allow free movement in all directions. The lower end of the arm is ball-jointed to a fixed support. The 'free' end of the trailer wheel axle is connected by a ball joint to the actuating device. The lower end of the actuating device is ball-jointed to a fixed support so that the 'free' end of the trailer wheel axle is able to move in any direction. The axis of the actuating device is perpendicular to the plane encompassing the axes of both trailer and chain wheel axles. The restraining and actuating linkages make use of a ball bearing of identical design to the bearing fitted to the trailer wheels. The normal trailer wheel fixings are used, and the prescribed torque values applied, for the test assembly. The actuating device is applied and released in each direction so as to cause a cyclic linear displacement. The peak displacement is 2 mm, above and below the nominal 'zero' position of the step/pallet (i.e. from the point with the axles chain and trailer wheel axles in the same plane). This ±2 mm displacement is related to a trailer roller to step/pallet chain roller centre distance of 400 mm. This ratio is also maintained, when the 400 mm dimension is varied.		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Annex G **(normative)** **Safety signs for the user of escalator and moving walks** The design of safety signs shall be in accordance with ISO 3864-1:2011 and ISO 3864-3:2012. The minimum diameter of the signs shall be 80 mm. See Figure G.1, G.2, G.3 and G.4.	**6.1.6.9.1** **6.1.6.9.2** **6.1.6.9.3**	**JEAS-2007(2017)** **Standard for making of escalator instruction manual** **3.(4) Introduction of warning sign**
Annex H **(informative)** **Guidelines for selection and planning of escalators and moving walks** **H.1 Maximum capacity** For traffic flow planning, the maximum number of persons that can be carried by an escalator or moving walk in 1 h is given in Table H.1	No equivalent requirement.	**BSLJ-EO (Structure of escalator)** **Article 129–12** **EXP. 1. (4) [Notice of designing (2)]** The official transportation capacity is assumed to be a table [see 2.4.2 Table 10] below according to rated speed. The official transportation capacity is maximum number which is capable of transportation theoretically, in case of escalator, the transportation number is one person/step for the S600 type, two persons/step for the S1000 type. In case of moving walk, the transportation number is one person for the S600 type, two persons for the S1000 type per the 400 mm length which is equivalent to the depth dimension of escalator step. An actual number of transportation is the number of people by which the boarding rate is multiplied for the official transportation ability. Generally, the boarding rate is about 50 % on average though temporarily reaches 80 % in transit system. Generally, two kinds of the escalator with step width of 600 mm (past 800 type) and 1 000 mm (past 1 200 type) are available. They are called as S600 type and S1000 type.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
H.2 Escalatos or moving walks for public transport For escalators or moving walks which: — are part of a public transport system including entrance and exit points, or — are suitable for intensive use, regularly operating for approximately 140 h/week with a load reaching 100 % of the brake load (see 5.4.2.1.3.1 and 5.4.2.1.3.3) for a total duration of at least 0,5 h during any time interval of 3 h, it is recommended to install auxiliary brakes also for rises h13 less than 6 m. The load conditions and additional safety features should be agreed between the manufacturer and the owner reflecting the traffic levels which exist.	No equivalent requirement.	No equivalent requirement.
Annex I **(normative)** **Requirements on escalator and moving walks intended to transport shopping trolleys and baggage carts** **I.1 Escalators** The use of both shopping trolleys and baggage carts on escalators is unsafe and shall not be permitted. The principle reasons why the use of these products is considered to be unsafe are foreseeable misuse, overloading and width restriction. Where shopping trolleys and/or baggage carts are available in the area around escalator installations and if it is reasonably foreseeable that trolleys and/or baggage carts can be taken onto the escalator, suitable barriers shall be provided to prevent access (see A.4).	**Scope**	**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). However, (1) and (2) shall not apply to the escalator providing following conditions. - 2 or more steps are kept in the same level of tread surface when the escalator carries the person sitting on wheelchair. - The rated speed in that operation does not exceed 30 m/min. - Stoppers for the wheels are furnished on the tip of that levelled tread surface. **(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].

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
If safe means of transportation, i.e. shopping trolleys or baggage carts, become available for use on escalators, then special measures should be defined between the manufacturer of the escalator, the manufacturer of the means of transportation and the customer based on risk assessment in accordance with EN ISO 14798:2013. Outline guidance is given as follows: Shopping trolleys or baggage carts which are chosen for use on an escalator shall be specified between the shopping trolley or baggage cart manufacturer and the escalator manufacturer. If non-specified shopping trolleys or baggage carts are available in the escalator area, there is a serious risk of misuse. It is necessary to prevent access to the escalator entrance. The width of the shopping trolley or baggage cart and its contents shall be at least 400 mm less than the nominal step width. Passengers shall be able to leave the escalator, even if shopping trolleys or baggage carts are on the escalator.		**(2)** The clearance between the adjacent steps should not exceed 5 mm. **EXP. [Notice of designing]** **1.** Escalator with steps for wheelchair **(1)** Only the attendant of the building manager shall be allowed to handle the wheelchair and operate the escalator carrying wheelchair. **(2)** The effective distance between the interior panels of balustrade should be approx. 1,2 m. **(3)** The speed of the escalator shall become zero or very slow when the person sitting on wheelchair gets on/off the escalator. **(4)** Operation panels should be furnished at the upper and lower landings. Emergency stop switch(es) which is effective in wheelchair carrying operation shall be furnished in intermediate section if necessary. **(5)** It is recommended that an interphone is furnished near the landing for requesting the wheelchair operation to the attendant of the building manager.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
The escalators shall be supplied with a horizontal step run of 1,6 m at both landing areas, minimum transition radius of 2,6 m at the upper landing and 2,0 m at the lower landing and limiting the nominal speed to 0,5 m/s and the inclination to 30°. Combs shall be designed with an angle β of max 19° combined with a diameter of the shopping trolley or baggage cart roller of at least 120 mm diameter. Additional stops for emergency situations according to A.2.5 shall be provided. The stop for emergency situations near the transition curve shall be reachable from inside the escalator and the stops for emergency situations at exit(s) shall be reachable from outside of the escalator. Shopping trolleys or baggage carts shall conform to the escalator design:		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— The shopping trolley or baggage cart design shall ensure a safe and correct loading. — The maximum weight for a shopping trolley or baggage cart shall be 160 kg when loaded. — Shopping trolley or baggage cart should automatically lock themselves on the inclined part of escalators. — Shopping trolley or baggage cart shall be fitted with a braking or blocking system. Shopping trolley or baggage cart shall have deflectors (bumpers) to reduce the risk of clamping. — For safe exit from the escalator, it is necessary that the rear rollers of the shopping trolley or baggage cart are able to push the front rollers over the comb. The front rollers and/or blocking system shall easily release from the steps. — Deflectors and guiding devices shall be added to the surrounding area to ensure correct alignment of shopping trolley or baggage cart when entering the escalator. — Safety signs about safe and correct use of the shopping trolley or baggage cart shall be added.		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
I.2 Moving walks The use of suitably designed shopping trolleys (according to EN 1929-2:2004 and EN 1929-4:2005) and baggage carts on moving walks is permitted. Shopping trolleys or baggage carts which are chosen for use on a moving walk shall be specified between the baggage cart manufacturer and the moving walk manufacturer. If non-specified shopping trolleys or baggage carts are available in the moving walk area, there is a serious risk of misuse. It is necessary to prevent access to the moving walk entrance (see A.4). The width of the shopping trolley or baggage cart and its contents shall be at least 400 mm less than the nominal pallet/belt width. Passengers shall be able to leave the moving walk, even if shopping trolleys or baggage carts are on the moving walk. For moving walks with an inclination greater than 6°, the nominal speed shall be limited to 0,5 m/s. Combs shall be designed with an angle β of max. 19° combined with a diameter of the shopping trolley or baggage cart roller of at least 120 mm diameter. Additional stops for emergency situations according to A.2.5 shall be provided. The stop for emergency situations near the transition curve shall be reachable from inside the moving walk and the stops for emergency situations at exit(s) shall be reachable from outside of the moving walk. Shopping trolleys or baggage carts shall conform to the moving walk design:	No equivalent requirement.	**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). However, (1) and (2) shall not apply to the escalator providing following conditions. - 2 or more steps are kept in the same level of tread surface when the escalator carries the person sitting on wheelchair. - The rated speed in that operation does not exceed 30 m/min. - Stoppers for the wheels are furnished on the tip of that levelled tread surface. **(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]. **(2)** The clearance between the adjacent steps should not exceed 5 mm. **EXP. [Notice of designing]** **1.** Escalator with steps for wheelchair **(1)** Only the attendant of the building manager should be allowed to handle the wheelchair and operate the escalator carrying wheelchair. **(2)** The effective distance between the interior panels of balustrade should be approx. 1,2 m. **(3)** The speed of the escalator should become zero or very slow when the person sitting on wheelchair gets on/off the escalator.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
— The shopping trolley or baggage cart design shall ensure a safe and correct loading. — The maximum weight for a shopping trolley or baggage cart shall be 160 kg when loaded. — Shopping trolley or baggage cart shall automatically lock themselves on the inclined part of moving walks. — Shopping trolley or baggage cart shall be fitted with a braking or blocking system. — Shopping trolley or baggage cart shall have deflectors (bumpers) to reduce the risk of clamping. — For safe exit from the moving walk, it is necessary that the rear rollers of the shopping trolley or baggage cart are able to push the front rollers over the comb. The front rollers and/or blocking system shall easily release from the pallet. — Deflectors and guiding devices shall be added to the surrounding area to ensure correct alignment of shopping trolley or baggage cart when entering the moving walk — Safety signs about safe and correct use of the shopping trolley or baggage cart should be added		**(4)** Operation panels should be furnished at the upper and lower landings. Emergency stop switch (es) which is effective in wheelchair carrying operation shall be furnished in intermediate section if necessary. **(5)** It is recommended that an interphone is furnished near the landing for requesting the wheelchair operation to the attendant of the building manager.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Annex J **(informative)** **Determination of anti-slip properties of the tread surface of steps and pallets, of comb plates and floor plates** **J.1 Introduction** The generally held requirement for anti-slip designs of tread surfaces for steps and pallets and of comb plates and floor plates formerly in EN 115:1995 needs to be made more precise for safe use in practice. Procedures for determining and assessing the anti-slip properties of coverings have not been standardized before either internationally or on a European level. However, in the Federal Republic of Germany, there have been tried and tested procedures for determining the anti-slip properties of floor coverings for many years - DIN 51130:2014[8] or Employers' Liability Insurance Association rules for health and safety at work: DGUV Regel 108-003[9]. The manufacturers of escalators and moving walks working together in the CEN/TC10/WG2 have checked this suitability procedure to see whether it can be applied to the corresponding components for escalators and moving walks. The results obtained show that the DIN 51130 procedure for determining the anti-slip properties of step and pallet coverings and comb plates and floor plates is suitable. The decision on the DIN 51130 procedure does not exclude other, at least just as safe solutions, which could have been set out too in the technical rules of other member states of the European Union or other states contracted to the Agreement on the European Economic Area.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Test certificates from test centres that are registered in other member states of the European Union or in other states contracted to the Agreement on the European Economic Area are taken into consideration in the same way as DIN 51130 test certificates if the tests, test procedures and construction requirements on which the test certificates of these centres are based are equivalent to the DIN 51130 ones. These centres are mainly those that meet the requirements set out in EN ISO/IEC 17025:2005 [10] or EN ISO/IEC 17065:2012 [11]. Test certificates issued under this standard contain the results of the DIN 51130 test and the resulting assessment in accordance with J.2.		
J.2 Testing and assessing anti-slip properties The procedure for testing anti-slip properties is governed by DIN 51130. Your attention is drawn to the fact that the intermediary medium of oil in the DIN 51130 test procedure is not used to give the test a particularly adverse operating condition. The use of a specific, defined oil is used as a constant test parameter with which, as has been proved, better differentiation of the test results is achieved.	No equivalent requirement.	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
NOTE This procedure is based on the people carrying out the test treading on the covering to be tested on an inclined plane. It is used as an aid to deciding whether the respective covering is suitable for use on escalators and moving walks. The average inclination angle determined from a range of measurements is critical for classifying the covering in one of five assessment groups. The assessment group is used as a benchmark for the level of anti-slip properties where coverings in assessment group R 9 meet the lowest anti-slip requirements and those in assessment group R 13 the highest. The allocation of assessment groups to the angle ranges is shown in Table J.1. **See Table 1 — Allocating the overall average values of the inclination angles to the anti-slip assessment groups** The assessment of the anti-slip properties of coverings with surface profiles shall take into account all directions. The lowest assessment group is the one relevant for safety purposes. Coverings that meet at least assessment group R 9 are considered anti-slip for installations in general. When impacted by water and snow the assessment group R 10 for escalators and moving walks and R 11 for pallets of inclined moving walks shall be considered. If, at the landings of escalators and moving walks and their allocated floors, there are different assessment groups, it should be taken care that neighbouring floors shall only differ by one in their assessment groups. The part of the test related to the area below the surface of cleated profiles is not used to assess the anti-slip properties of coverings on escalators and moving walks.		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Annex K **(informative)** **Determination of sliding properties of footwear on balustrade skirting** **K.1 Introduction** On escalators there is the danger of being entrapped between the moving step band and the stationary balustrade skirting. To reduce the risk several requirements are defined in 5.5.3.4. One of these is that suitable measures are necessary to be taken to reduce the sliding friction of skirting panels. This general requirement shall be made more specific for safe use in practice. Procedures for determining and assessing the sliding properties of coverings have not be standardized before either internationally or on a European level. But there is a German standard, DIN 51131:2014 [12], that shall be submitted to the CEN as the German proposal for a European Standard. This standard sets out parameters for measuring the kinetic friction coefficients μ on surfaces that are normally trodden on with footwear. Using this procedure the conditions to be taken into consideration on escalators can largely be reproduced.	**6.1.3.3.9**	No equivalent requirement.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
The manufacturers of escalators and moving walks working together on the CEN/TC 10/WG 2 have checked this suitability procedure to see whether it can be applied. The results obtained show that the procedure as per DIN 51131 for determining the sliding properties of balustrade skirting is suitable. In addition an upper limit for the kinetic friction coefficient μ of skirting panels was determined from the test results that, together with the other requirements in EN 115 1, sufficiently reduces the risk of being entrapped. The decision on the DIN 51131 procedure does not exclude other, at least just as safe solutions, which could also have been set out in technical rules of other member states of the European Union or other states contracted to the Agreement on the European Economic Area. Test certificates from test centres that are registered in other member states of the European Union or in other states contracted to the Agreement on the European Economic Area are taken into consideration in the same way as DIN 51131 test certificates if the tests, test procedures and construction requirements on which the test certificates of these centres are based are equivalent to the DIN 51131 ones. These centres are mainly those that meet the requirements set out in EN ISO/IEC 17025:2005 or EN ISO/IEC 17065:2012.		

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
Test certificates issued under this standard contain the results of the DIN 51131 test and the resulting assessment in accordance with K.2. **K.2 Testing and assessing sliding properties** The procedure for testing sliding properties is governed by DIN 51131. In order to reproduce conditions on escalators as realistic as possible, tests should be carried out according to DIN 51131 with rubber only. For the slider material and skirting panel used for testing, the average of the kinetic friction coefficient μ is calculated from the third to the fifth individual measurements.		
Annex L **(informative)** **Major modification** A major modification is a change of the location, a change of the nominal speed, of the electric safety devices, of the braking system, of the drive, of the control, of the step band, of the truss and of the balustrades. Wherever applicable, the principles set forth for the constructional inspection and acceptance inspection and test (7.3.2) should apply to the new environmental conditions, modified components and other components which are affected. The replacement of parts by parts of same design is not considered to be a major modification. Modifications according EN 115-2 are not considered as major modifications.	**8.7.6** **8.7.6.1** **8.7.6.1.1** **8.7.6.1.2** **8.7.6.1.3** **8.7.6.1.4** **8.7.6.1.5** **8.7.6.1.6** **8.7.6.1.7** **8.7.6.1.8** **8.7.6.1.9** **8.7.6.1.10** **8.7.6.1.11** **8.7.6.1.12**	**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
Escalators and moving walks should be inspected after major modifications and at regular intervals. Such inspections and tests should be made by a competent person.	**8.7.6.1.13** **8.7.6.1.14** **8.7.6.1.15** **8.7.6.1.16** **8.7.6.1.17** **8.7.6.1.18** **8.7.6.2** **8.7.6.2.1** **8.7.6.2.2** **8.7.6.2.3** **8.7.6.2.4** **8.7.6.2.5** **8.7.6.2.6** **8.7.6.2.7** **8.7.6.2.8** **8.7.6.2.9** **8.7.6.2.10** **8.7.6.2.11** **8.7.6.2.12** **8.7.6.2.13** **8.7.6.2.14**	

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
	8.7.6.2.15 **8.7.6.2.16** **8.7.6.2.17** **8.7.7** **8.7.7.1** **8.7.7.1.1** **8.7.7.1.2** **8.7.7.2** **8.7.7.3** **8.7.7.3.1** **8.7.7.3.2** **8.7.7.3.3** **8.7.7.3.**	
Annex M **(normative)** **Escalator and moving walks subject to seismis conditions** **M.1 Introduction** This annex specifies the special provisions and safety rules for escalators and moving walks permanently installed in buildings that are in compliance with EN 1998-1:2004 (Eurocode 8).	**SECTION 8.5** **Refer IBC section 1.3, building code.** **Refer SBC 1982 / SBC 1994 etc** **8.5.1** **8.5.2** **8.5.2.1** **8.5.2.1.1** **8.5.2.1.2** **8.5.2.1.3** **8.5.2.2** **8.5.2.3**	**MLIT-N (No. 541–2009)** Establishment of structural method to ensure that there is no danger of displacement of interfaces with roller connections as a result of earthquakes or other vibrations The step roller shall not be dropped off from track rail by earthquakes and other vibrations. **MLIT-N (No.1046-2013)** **Establishment of a structural method to ensure that there is no danger of an escalator becoming detached as a result of earthquakes or other vibrations**

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
	8.5.3 **8.5.3.1** **8.5.3.2** **8.5.3.2.1** **8.5.3.2.2** **8.5.3.3** **8.5.4** **8.5.5**	**<Concerning Annex M of EN 115, hereinafter the regulation number MLIT-N (No.1046-2013)>**
M.2 Structural requirements **M.2.1 General** Escalators and moving walks within the scope of this standard shall comply with the relevant safety requirements and/or protective measures of this annex when they are subject to seismic conditions.	No equivalent requirement.	The structural method to ensure that there is no danger of an escalator becoming detached as a result of earthquakes or other vibrations under the provisions of Article 129-12, paragraph 1, item (6) of the Building Standard Law Enforcement Order (Cabinet Order No. 338 of 1950, hereinafter referred to as "the Order") shall be established by one of the following items, excluding cases where the escalator is constructed independently on the floor or on the ground, and other cases where it is clear that there is no danger of an escalator becoming detached as a result of earthquakes or other vibrations.
M.2.2 Supports The support conditions of the escalators and moving walks in combination with the building shall be secured so that the escalators and moving walks under seismic conditions are not subjected to constraint. One support shall be designed as fixed support the other supports shall be designed as movable in horizontal direction. The supporting conditions shall be simple statically determined. Escalators and moving walks shall be retained on the supports in vertical direction by adequate measures so that they cannot be displaced from the supports under seismic conditions	No equivalent requirement.	**I.1.(2)** Regarding the structure that supports the truss or the beams of the escalator (hereinafter referred to as "truss, etc."), one end of the truss, etc. shall be fixed to a beam or other solid part of the building (hereinafter referred to as "building beam, etc.") using support members, and support members of the other end shall be installed so that the truss, etc. slide above the building beam, etc. (hereinafter referred to as "one-end anchored state"), or the support members of both ends of truss, etc. shall be installed so that the truss, etc. slides above the building beams, etc. (hereinafter referred to as "both-ends unanchored state").

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
M.2.3 Arrangement The length and the movability of the escalators and moving walks shall be chosen in accordance with the building movement between two storeys of the building. The supports shall be designed so that they overlap the building interface. For the determination of the overlap the theoretical maximum "storey drift" of the building shall be used.	No equivalent requirement.	**I.1.(3)** Concerning the long side direction of the horizontal projection of the escalator (hereinafter referred to simply as “long-side direction”) in the part to be installed with the truss, etc. slide (hereinafter referred to as “unanchored part”), when the distance between the buildings with supporting members at one end of the truss, etc. installed and the buildings with supporting members at the other end installed (hereinafter simply referred to as “distance between building beams, etc.”) become longer by earthquakes or other vibrations, the horizontal distance that the supporting members of the truss, etc. can slide (hereinafter in this notification, referred to as“overlap length”) shall conform to an equation in the following table, according to the cases in (a) and (b), below [see 2.4.1 Figure 8 and 9]: **I.1.(4)** The escalator’s unanchored parts shall not collide with the building beam, etc. due to the story drift at the design-use story drift angle in the short-side direction of the horizontal projection of the escalator. **I.1.(5)** The design-use story drift angle in the item 2 above, **II.1.(4)** and **III** shall conform to one of the following items: **(a)** It shall be at least 5 times or more the percentage of the story drift calculated under the provisions of Article 82-2 of the Order (if this value is less than 1/100, 1/100) to the height of each story. **(b)** In the case of an escalator installed in a building of steel frame construction where braces bear most of the seismic force, and that corresponds to a building under the provisions of Notification of Ministry of Land, Infrastructure and Transport No. 593-2007, I.(a) or (b), it shall be 1/100 or more.

Table 1 *(continued)*

EN 115-1:2017	ASME A17.1/CSA B44:2016	Japanese codes 2016
		(c) In the case of an escalator installed in a reinforced concrete building that corresponds to a building under the provisions of Notification of Ministry of Land, Infrastructure and Transport No. 593-2007, II.(a), it shall be 1/100 or more. **(d)** In a case where the design-use story drift angle during an earthquake can be calculated based on the results of a special survey or research, it shall be a value equal to or higher than the calculated value (if this value is less than 1/100, 1/100). **(e)** It shall be 1/24 or more. **I.1.(6)** The part fixed to a building beam, etc. using support members at one end of a truss, etc. (hereinafter referred to as, "anchored part"), shall not cause deformation that would compromise safety in a case where a horizontal load is applied by seismic force of the following equation and in the case in (ii) and (iii) of the table in I.1.3.(a). [See 2.4.2 Table 13]