

PD ISO/TR 14799-1:2015



BSI Standards Publication

Comparison of worldwide escalator and moving walk safety standards

Part 1: Rule by rule comparison

bsi.

...making excellence a habit.
AVA Documents™
Document Sharing Hub

National foreword

This Published Document is the UK implementation of ISO/TR 14799-1:2015. It supersedes PD ISO/TR 14799-1:2005 which is withdrawn.

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

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2015.

Published by BSI Standards Limited 2015

ISBN 978 0 580 80717 6

ICS 91.140.90

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 December 2015.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

TECHNICAL REPORT

ISO/TR
14799-1

Second edition
2015-12-01

Comparison of worldwide escalator and moving walk safety standards —

Part 1: Rule by rule comparison

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

Partie 1: Comparaison paragraphe par paragraphe



Reference number
ISO/TR 14799-1:2015(E)

AVA Documents
Document Sharing Hub
© ISO 2015



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Rule by rule comparison	1
2.1 General.....	1
Annex A (informative) Figures of EN 115-1	154
Annex B (informative) Tables mentioned in the column for Japanese codes	160
Annex C (informative) References in the compared codes	162
Annex D (informative) Addresses of standardization bodies occupied with the compared codes	166

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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 178, *Lifts, escalators and moving walks*.

This second edition cancels and replaces the first edition (ISO/TR 14799-1:2005), which has been technically revised.

ISO/TR 14799 consists of the following parts, under the general title *Comparison of worldwide escalator and moving walk safety standards*:

- *Part 1: Rule by rule comparison*
- *Part 2: Abbreviated comparison and comments*

[Annexes A](#) to [C](#) form an integral part of this part of ISO/TR 14799.

Introduction

At the 1995 plenary meeting of ISO/TC 178, the work on a comparison of worldwide standards which includes the American, Australian, European, Russian, and Japanese escalator and moving walk safety code was passed to ISO/TC 178 (Resolution Singapore 1995/114). In October 1995, working group 5 was officially formed to carry out the task of preparing a cross reference between the relevant sections of these standards and to analyse the differences on selected subjects. 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 may initiate a gradual convergence of the technical requirements. In 1996, the study was expanded to include the Korean safety standard.

The content of this Technical Report is based on the information provided by the WG 5 members acting in personal capacity.

This Technical Report 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.

This Technical Report is not intended to replace existing safety standards which may have been updated. Conclusions are arrived at in some cases, but only where there is unanimity amongst the various experts. In other cases, the reasons for the divergent views are expressed.

This Technical Report is to be read in conjunction with the various safety standards. Unless approved by the relevant standard writing organizations, the information contained in this Technical Report does not necessarily represent the opinions of these standards writing organizations (see Annex C for references).

This Technical Report was done with EN 115-1:2008 and its Amendment A1:2010 as a reference document shown as the only one in its normal sequence. All other codes are not in their normal sequence and logical order. They are structured differently to EN 115-1. The resultant incorrectly leaves the impression of incompleteness of these standards. These standards in their original structure inclusive of their references to other standards and requirements are however complete.

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

Comparison of worldwide escalator and moving walk safety standards —

Part 1: Rule by rule comparison

1 Scope

This part of ISO/TR 14799 consists of a comparison of the requirements of selected topics as covered by the following worldwide safety standards (excluding local deviations):

- a) Europe (CEN) – EN 115-1, *Safety of escalators and moving walks — Part 1: Construction and installation* (Edition 2010, including Amendment 1);
- b) North America - ASME A17.1/CSA B44-2010, *Safety Code for Elevators and Escalators*;
- c) Japan – Safety requirements mainly comprised of Building Standard Law Enforcement Order (BSLJ-EO), Notifications of Ministry of Construction (MOC-N), Japan Industrial Standard (JIS), and Japan Elevator Association Standard (JEAS).

NOTE The original Japanese codes were written in Japanese and no official English versions had been released. Listed Japanese codes were carefully translated, but the original is corresponding to the translation sentence is not guaranteed.

It is to be noted that in addition to the above listed standards and other regulations, escalators and moving walks may be required to conform to the requirements of other standards, as appropriate. Where ISO/TC 178 was aware of these standards, they are mentioned in Annex C.

2 Rule by rule comparison

2.1 General

This comparison is between EN 115-1, the rules in A17.1/B44, and the Japanese codes. There are other standards in the countries concerned that have requirements not shown in the escalator/moving walk standards compared, but address some of the same requirements as EN 115-1 (see list in [Clause 1](#)).

The principal dimensions (e.g. L_1 , b_8 , h_6 , etc.) of EN 115-1 can be seen in the figures shown in [Annex A](#).

NOTE 1 EN 115-1 clause numbers in brackets serve only as a reference point. They do not exist in the published EN 115-1.

NOTE 2 Where the Australian Standard requirements are given in italics, they only apply to moving walks.

NOTE 3 Where a clause number in parentheses is used, this serves only as a reference point to EN 115-1.

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
Introduction This standard is a type C standard as stated in ISO 12100-1. The machinery concerned and the extent to which hazards, hazardous situations, and events are covered are indicated in the scope of this standard. When the provisions of this C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards for machines that have been designed and built according to the provisions of this type C standard.	No equivalent statement	—
The purpose of this standard is to define safety rules for escalators and moving walks in order to safeguard people and objects against risks of accidents during operation, maintenance, and inspection work	GENERAL This code is one of the numerous codes and standards developed and published by the American Society of Mechanical Engineers (ASME) under the general auspices of the American National Standards Institute, Inc. (ANSI). The code is intended to serve as the basis for state, municipal, and other jurisdictional authorities in drafting regulations governing the installation, testing, inspection, maintenance, alteration, and repair of elevators, dumbwaiters, escalators, moving walks, material lifts with automatic transfer devices, wheelchair lifts, and stairway chairlifts. It is also intended as a standard reference of safety requirements for the guidance of architects, engineers, insurance companies, manufacturers, and contractors, and as a standard of safety practices for owners and management of structures where equipment covered in the scope of the code is used. Safety codes and standards are intended to enhance public health and safety. Revisions result from committee consideration of factors such as technological advances, new data, and changing environmental and industry needs. Revisions do not imply that previous editions were inadequate.	

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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. 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 statement	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
—	—	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.
—	—	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.

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
		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 officials) of a building as mentioned in article 6, paragraph 1, item (1), or any other building specified by cabinet order as mentioned in the preceding paragraph and designated by the special administrative agency, shall, in accordance with Ministry of Construction Order, have a 1st-class licensed architect/building engineer, 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.
—	PREFACE APPLICATION OF RULES TO NEW TECHNOLOGY Where present rules are not applicable or do not describe the product or system, the enforcing authority should recognize the need for exercising latitude and granting exceptions where the product or system is equivalent in quality, strength or stability, fire resistance, effectiveness, durability, and safety to that intended by the present code rules.	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
—	1.1 Equipment covered by this code The provisions of this code are not intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety to those prescribed by this code provided that there is technical documentation to demonstrate the equivalency of the system, method, or device. The specific requirements of this code may be modified by the authority having jurisdiction based upon technical documentation or physical performance verification to allow alternative arrangements that will ensure safety equivalent to that which would be provided by conformance to the corresponding requirements of this code.	—
	Definitions: enforcing authority - see authority having jurisdiction. approved - acceptable to the authority having jurisdiction. authority having jurisdiction - the organization, office, or individual responsible for approving equipment. Where compliance with this code has been mandated by law, the “authority having jurisdiction” is the federal, state, or local department or individual so designated in the enacting legislation or administrative regulation.	
It is assumed that negotiations have been made for each contract between the customer and the supplier/installer (see also Annex A) about the following: 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. If escalators or moving walks are intended to be operated under special conditions such as directly exposed to the weather or explosive	Outdoor escalators 6.1.8.1/6.2.8.1 Weatherproofing. Escalators/moving walks shall be so constructed that exposure to the weather will not interfere with normal operation. 6.1.8.1.1/6.2.8.1.1 The escalator/moving walk equipment and its supports shall be protected from corrosion. 6.1.8.1.2/6.2.8.1.2 Electrical equipment shall be provided with a degree of protection of at least type 4 construction as specified in NEMA 250 and wiring shall be identified for use in wet locations in accordance	JEAS 520 Installation for outdoor condition 2 Description 2.1 Classification of the outdoor type and the semi-outdoor type escalator The escalator without overhead roof or whose line connecting the roof edge and the escalator forms an angle of less than 30° to the vertical line is classified as the outdoor type (refer to Figure 1) and the escalator with above angle of not less than 30° and not more than 70° is classified as the semi-outdoor type (refer to Figure 2).

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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.	with NFPA 70 or CSA C22.1, as applicable (see Part 9). 6.1.8.2/6.2.8.2 Precipitation. A cover directly over the horizontal projection of the escalator/moving walk shall be provided. The cover shall extend outward from the centerline of the handrail so that a line extended from the edge of the cover to the centerline of the handrail forms an angle of not less than 15° from the vertical. 6.1.8.2.1/6.2.8.2.1 When the escalator/moving walk is subjected to blowing snow or freezing rain, heating systems shall be operated to prevent accumulation of snow or ice on the steps/treradway, landings, and skirt deflector devices. The heating systems operation shall be thermostatically controlled and independent of the escalator/moving walk operation. 6.1.8.2.2/6.2.8.2.2 Drains suitable for all weather conditions shall be provided to prevent the accumulation of water. 6.1.8.3/6.2.8.3 Slip resistance. Landing plates and combplates shall be designed to provide a secure foothold when wet.	2.2 Considerations in construction As to the outdoor type and the semi-outdoor type escalators, the following considerations by the building side are required. It is also recommended that a roof be furnished especially in case of rainfall or snowfall where the treads are slippery and the passengers may lose their balances when getting on and off with the use of umbrellas. (1) The landings of the escalator should be installed higher than the surrounding floors so that rainwater or snow may not flow into the inside of the escalator and the drainage slope, as well as the drainage should be provided (refer to Figure 3). (2) An equipment for releasing water accumulated inside of the lower pit of the escalator should be furnished. Further, as drained water is mixed with oil, dust, or pebbles, a proper filtering device at the external drain is required and measures to prevent any adverse flow are recommended (refer to Figure 4) (3) In consideration of the use during night time etc., lighting fixtures are necessary to be equipped for the passengers to be able to see where they are stepping well. (4) At the pull-in end of the power source for the escalator, necessary protection measures are required. (5) The supervisory panel for supervision, TV camera, or the like are preferable to be furnished. (6) Depending on the installation circumstances, measures by heating devices or the like are recommended to be equipped to prevent freezing etc.

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
		2.3 Considerations on supervision Concerning the outdoor type or the semi-outdoor type escalator, the following considerations on supervision in operation are recommendable. (1) In case of snowfall or freezing in winter, operation of the escalator should be suspended to prevent the passengers from sliding and the equipment from being damaged. (2) When operation of escalator is suspended, necessary measures should be taken not to be used as a stairway. (3) The lifetime of the equipment of the escalator which was installed under outdoor or semi-outdoor is generally shorter than that of indoor and therefore, regular maintenance and inspection in accordance with the installation circumstances are indispensable. 2.4 Considerations on equipment Concerning the outdoor type or the semi-outdoor type escalator, the following considerations are required. (1) Adequate rustproof measures for the main structures are required. (2) Necessary protection measures for the electric apparatus are required.
An Interpretation Committee has been established to clarify, if necessary, the spirit in which the clauses of the standard have been drafted and to specify the requirements appropriate to particular cases. Interpretation requests can be sent to the National Standard Bodies which will contact the responsible Technical Committee (CEN/TC 10). The formats of an interpretation request and the interpretation are given in Annex L.	Requesting Interpretations. On request, the A17 committee will render an interpretation of any requirement of the code. Interpretations can only be rendered in response to a written request sent to the secretary of the main committee. The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his request utilizing the following format:	There is no Interpretation Committee.

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
	Subject: Cite the applicable rule number(s) and a concise description. Edition: Cite the applicable edition and supplement of the code for which the interpretation is being requested. Question: Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings which are necessary to explain the question, however, they should not contain proprietary names or information. Requests which are not in this format will be rewritten in this format by the committee prior to being answered which may inadvertently change the intent of the original request. ASME procedures provide for reconsideration of any interpretation when or if additional information which might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME committee or subcommittee. ASME does not “approve,” “certify,” “rate,” or “endorse” any item, construction, proprietary device, or activity.	

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
1 Scope 1.1 This standard is applicable for all new escalators and moving walks (pallet or belt type) as defined in Clause 3.	Scope equipment covered by this code This code of safety standards covers the design, construction, operation, inspection, testing, maintenance, alteration, and repair of the following equipment, its associated parts, and its hoistways, where located, in or adjacent to a building or structure (except as modified by paragraph 1.2): a) hoisting and lowering mechanisms equipped with a car or platform which move between two or more landings. This equipment includes, but is not limited, to the following (see Section 3, definitions): (1) elevators; (2) wheelchair and stairway chairlifts; b) power-driven stairways and walkways for carrying persons between landings. This equipment includes, but is not limited, to the following (see Section 3, definitions): (1) escalators; (2) moving walks; c) hoisting and lowering mechanisms equipped with a car which serves two or more landings and is restricted to the carrying of material by its limited size or limited access to the car. This equipment includes, but is not limited to, the following (see Section 3, definitions): (1) dumbwaiters; (2) material lifts and dumbwaiters with automatic transfer devices.	BSLJ (scope of application) Article 3 The provisions of this section shall apply to the elevatory equipment installed in buildings and described in each of the following items. (2) Escalator Notwithstanding the provision of the preceding paragraph, the provisions of each said item shall not apply to the elevatory equipment described in following each item. (2) 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 Article 129-12, paragraph 1.

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
1.2 This standard does not deal with hazards arising from seismic activities.	SECTION 8.5: ESCALATOR AND MOVING WALK SAFETY REQUIREMENTS FOR SEISMIC RISK ZONE 2 OR GREATER Requirement 8.5 applies to all escalators and moving walks installed in buildings that are designed and built to the requirements of, and located in, seismic risk zone 2, or greater, as defined by the building code (see 1.3). Where the applicable building code does not make reference to seismic risk zones, the ground motion parameters shown in 8.4.13 shall be used. The escalator and moving walk safety requirements contained in 8.5 shall be in addition to the requirements in the other parts of the code, unless otherwise specified. 	MOC-N (No. 541-2009) The step roller shall not be dropped off from track rail by earthquakes and other vibrations.
1.3 This document is not applicable to escalators and moving walks which were manufactured before the date of its publication as EN. It is, however, recommended that existing installations be adapted to this standard.	1.3 Application of parts (of A17.1/B44) This code applies to new installations only, except Parts X, XII, and XIX which apply to both new and existing installations. Definitions: - installation, new - any installation not classified as an existing installation by definition, or an existing elevator, dumbwaiter, escalator, material lift, inclined lift, or moving walk moved to a new location subsequent to the effective date of this code. - installation, existing - an installation that has been completed or is under construction prior to the effective date of this code. - installation placed out of service - an installation whose power feed lines have been disconnected from the mainline disconnect switch and an escalator or moving walks whose entrances have been permanently barricaded.	BSLJ; Art. 3, 3(3)

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
(1.4)	6.1.3.14/6.2.3.17 Non-escalator/moving walk-related equipment. Components not used directly in connection with the escalator/moving walk are prohibited to be installed on, in, or through the escalator/moving walk.	—
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.	SECTION 4: REFERENCE CODES, STANDARDS, AND SPECIFICATIONS This section covers the codes, standards, and specifications incorporated in this code by reference, the specific editions which are applicable, and the rules of this code which reference each document [see Table 4(a)]. This section also lists the names and addresses of the organizations from which these documents may be procured [see Table 4(b)]. Only that portion of the code, standard, or specification as specified by the rule in this code is applicable.	JIS The following standards are cited in JIS A 4302 - 1992.....
3 Definitions 3.1 Terms and definitions For the purposes of this document, the terms and definitions given in ISO 12100-1:2003 and the following apply. 3.1.1 angle of inclination: maximum angle to the horizontal in which the steps, the pallets, or the belt move.	—	—
3.1.2 balustrade: part of the escalator/moving walk which ensures the user's safety by providing stability, protecting from moving parts, and supporting the handrail	—	—
3.1.3 balustrade decking: transverse member of the balustrade which meets the handrail guidance profile and which forms the top cover of the balustrade	—	—
3.1.4 brake load: load on the step/pallet/belt which the brake system is designed to stop the escalator/moving walk	—	—
3.1.5 a comb: pronged section at each landing that meshes with the grooves	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
3.1.5 b comb plate: platform at each landing to which the combs are attached	—	—
3.1.6 electrical safety system: safety related part of the electrical control system as an arrangement of safety circuits and monitoring devices	—	—
3.1.7 electrical safety devices: part of a safety circuit consisting of safety switches and/or fail safe circuits	—	—
3.1.8 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 Escalators are machines even when they are out of operation and cannot be considered as fixed staircases.	SECTION 3: DEFINITIONS This section defines various terms used in this code. In addition, a number of other terms are defined for the standardization of nomenclature and terminology ³⁾ <i>3) There are many more definitions in A 17.1 than is shown here. The ones shown here correspond to the definitions in EN 115.</i> escalator - power-driven, inclined, continuous stairway used for raising or lowering passengers - escalator, conventional - an escalator on which the running gear is driven by a single drive shaft at a terminal - escalator, modular - an escalator on which the running gear along the incline is driven by one or more drive units	BSLJ-EO; Article 129-3,EXP. 1(2) The escalator means “power driven, continuous stairway or walkway for the transport of passengers”.
3.1.9 exterior panel: part of the exterior side of the enclosure of an escalator or moving walk	—	—
3.1.10 fail safe circuit: safety related electrical and/or electronic system with defined failure mode behaviour	—	—
3.1.11 handrail: power-driven moving rail for persons to grip while using the escalator or moving walk	—	—
3.1.12 interior panel: panel located between the skirting or lower inner decking and the handrail guidance profile or balustrade decking	—	—
3.1.13 a lower inner decking: profile that connects the skirting with the interior panel when they do not meet at a common point	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
3.1.13 b lower outer decking: profile that connects the exterior panels with the interior panel	—	—
3.1.14 machinery: escalator or moving walk machine(s) mechanisms and associated equipment	—	—
3.1.15 machinery spaces: space(s) inside or outside of the truss where the machinery as a whole, or in parts, is placed	—	—
3.1.16 maximum capacity: maximum flow of persons that can be achieved under operational conditions	—	—
3.1.17 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 Moving walks are machines even when they are out of operation and should not be used as a fixed access.	moving walk - a type of passenger-carrying device on which passengers stand or walk and in which the passenger-carrying surface remains parallel to its direction of motion and is uninterrupted - moving walk, belt pallet type - a moving walk with a series of connected and power-driven pallets to which a continuous belt treadway is fastened - moving walk, belt type - a moving walk with a power-driven continuous belt treadway - moving walk, edge supported belt type - a moving walk with the treadway supported near its edges by succession of rollers - moving walk, pallet type - a moving walk with a series of connected and power-driven pallets which together constitute the treadway - moving walk, roller bed type - a moving walk with the treadway supported throughout its width by a succession of rollers - moving walk, slider-bed type - a moving walk with the treadway sliding upon a supporting surface	BSLJ-EO; 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.
3.1.18 newel: end of the balustrade	—	—
3.1.19 nominal speed: speed in the direction of the moving steps, pallets, or the belt when operating the equipment under no load condition (i.e. without persons) stated by the manufacturer as that for which the escalator or moving walk has been designed	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
3.1.20 programmable electronic system in safety related applications for escalators and moving walks (PESSRAE): system for control, protection, or monitoring based on one or more 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 6.	—	—
3.1.21 rated load: load which the equipment is designed to move NOTE For maximum capacity, see Annex H.	rated load - <i>elevator, dumbwaiter, escalator, or inclined lift</i> - the load which the equipment is designed and installed to lift at the rated speed; - <i>moving walk</i> - the load which the moving walk is designed and installed to move, horizontally or at an incline at the rated speed	—
3.1.22 rise: vertical distance between the upper and lower finished floor levels	—	—
3.1.23 safety circuit: part of the electric safety system consisting of electrical safety devices	—	—
3.1.24 safety integrity level (SIL): discrete level for specifying the safety integrity requirements of the safety functions to be allocated to the PESSRAE NOTE 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.	—	—
3.1.25 skirting: vertical part of the balustrade interfacing with the steps, pallets, or belt	—	—
3.1.26 skirt deflector: device to minimize the risk of trapping between the step and the skirting	—	—
3.1.27 stand-by operation: mode in which an escalator/ moving walk can be stopped or operated under no load condition with any speed below the nominal speed	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
3.1.28 system reaction time: sum of the following two values: a) time period between the occurrence of a fault in the PESSRAE and the initiation of the corresponding action on the escalator/moving walk; b) time period for the escalator/moving walk to respond to the action maintaining a safe state	—	—
(3.1.29)	rated speed - the speed at which the elevator, dumbwaiter, escalator, moving walk, material lift, or inclined lift is designed to operate under the following conditions: - elevator, dumbwaiter, or material lift - the speed in the up direction with rated load in the car (also see operating speed in the down direction) - escalator or inclined lift - the rate of travel of the steps or carriage measured along the angle of inclination with rated load on the steps or carriage. In the case of a reversible escalator, the rated speed shall be the rate of travel of the steps in the up direction measured along the angle of inclination with rated load on the steps. - moving walk - the rate of travel of the treadway horizontally or at an incline with rated load on the treadway. In the case of reversible inclined moving walks, the rated speed is the rate of travel of the treadway in the up direction measured along the angle of inclination, with rated load on the treadway.	BSLJ-EO 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.
(3.1.30)	<i>The A 17.1 is a safety code which applies equally to all escalators regardless of their use. The loading patterns and useful life of the equipment is a commercial issue and not one of safety.</i>	—
(3.31)	controller - a device or group of devices which serves to control in a predetermined manner the apparatus to which it is connected.	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
(3.32)	driving machine - the power unit which applies the energy necessary to raise and lower an elevator, material lift, or dumbwaiter car, or to drive an escalator, an inclined lift, or a moving walk.	—
(3.33)	flat steps - the distance, expressed in step length, that the leading edge of the escalator step travels after emerging from the comb before moving vertically	—
(3.34)	landing - the stationary area at the entrance to or exit from an escalator/moving walk	—
(3.35)	pallet, moving walk - one of a series of rigid platforms which together form an articulated treadway or the support for a continuous treadway	—
(3.36)	slope, moving walk - the angle which the treadway makes with the horizontal	—
(3.37)	travel (rise) - the vertical distance between the bottom terminal landing and the top terminal landing of an elevator, dumbwaiter, escalator, material lift, or inclined lift.	—
(3.38)	treadway, moving walk - the passenger-carrying member of a moving walk.	—
(3.39)	width, moving walk - the exposed width of the treadway. 6.1.3.2/6.2.3.2 Geometry 6.1.3.2.1/6.2.3.2.1 The width of the escalator/moving walk shall be the width of step tread/exposed tread (see 6.1.3.5.2, for step width requirements, see 6.2.3.7)	—
3.2 Symbols and abbreviations See Table 1.	—	—
4 List of significant hazards 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 ISO 14121-1.	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
5 Safety requirements and/or protective measures 5.1 General Escalators and moving walks shall comply with the safety requirements and/or protective measures of this clause. In addition, escalators and moving walks shall be designed according to the principles of ISO 12100-2 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).	—	—
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).	6.1.2.1/6.2.2.1 Protection required The sides and undersides of an escalator/moving walk truss or group of adjacent trusses in a single wellway shall be enclosed in materials defined as either non-combustible or limited-combustible by the building code or ANSI/NFPA 101¹⁾. Means provided for adequate ventilation of the driving machine and control spaces when included in the truss enclosure area shall be permitted.	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
	<i>1) The term "fire resistive materials" has been replaced with a specific specification to eliminate subjective interpretations by the enforcing authorities.</i> 6.1.3.3.1/6.2.3.3.1 Construction (b) The balustrade shall be totally closed except for the following: (1) where the handrail enters the newel base (see 6.1.3.4.3/6.2.3.4.2); (2) gaps between interior panels shall not be wider than 5 mm (0,19 in.). The edges shall be rounded or bevelled. 6.1.3.6/6.2.3.8.5 Floor opening protection adjacent to escalator/moving walk wellway. Floor openings adjacent to the entire length of the escalator/moving walk wellway shall be provided with protection in accordance with the applicable building code (see Part 9).	
5.2.1.2 The exterior panels shall withstand a force of 250 N at any point at right angles on an area of 25 cm ² without breakage or deflection resulting in any gap. The fixing shall be designed in that way to carry at least twice the dead load of the enclosure.	<i>(defined in building codes)</i>	
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.	—	—
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.	8.6.8/8.6.9 Maintenance of escalator/moving walks 8.6.8.13/8.6.9.11 Cleaning. the interiors of escalators/moving walks, and their components shall be periodically cleaned to prevent an accumulation of oil, grease, lint, dirt, and refuse. The frequency of the cleaning will depend on service and conditions, but an inspection to determine if cleaning is necessary shall be required at least once a year.	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
5.2.1.5 Ventilation apertures shall be built or arranged in such a way to comply with ISO 13857:2006, 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.	6.1.2.1/6.2.2.1 Protection re-quired. The sides and undersides of an escalator/moving walk truss or group of adjacent trusses in a single wellway shall be enclosed in materials defined as either noncombustible or limited-combustible by the building code or ANSI/NFPA 101 ¹⁾ . Means provided for adequate ventilation of the driving machine and control spaces when included in the truss enclosure area shall be permitted.	—
5.2.1.6 Any exterior panels which are designed to be opened (e.g. for cleaning purposes) shall be provided with an electric safety device according to Table 6 n).	There is no equivalent rule requiring a safety device. The following rule is closest to meet the requirement, but requires group 2 security. 6.1.7.3.3/6.2.7.3.3 If access doors are provided in the side of the escalator/moving walk enclosure, they shall be kept closed and locked. The key shall be removed only when in the locked position. The key shall be of group 2 security (see 8.1).	—
5.2.2 Angle of inclination The angle of inclination, α , of the escalator shall not exceed 30°, but for rises, h_{13} , not exceeding 6 m and a nominal speed not exceeding 0,50 m/s, the angle of inclination is permitted to be increased up to 35° (see α in Figure 2). The angle of inclination of moving walks shall not exceed 12°.	6.1.3 Construction requirements 6.1.3.1 Angle of inclination. The angle of inclination shall be designed not to exceed 30° from the horizontal, but due to field conditions at the site shall be permitted to exceed this maximum by 1°. The angle shall be measured at the centerline of the steps. 6.2.3.1 Angle of inclination. The angle of inclination from the horizontal shall not exceed 3° within 900 mm (36 in.) of the entrance and egress ends and shall not exceed 12° at any point.	BSLJ-EO; Article 129-12 1.(2) The inclination shall be 30° or less. BSLJ-EO; 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.

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
		MOC-N (No.1413-2000) 2. The escalators of the special construction or the special use form to which the provisions described in the Art.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 Art.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 Art.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 be 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).	See 8.1.3 "Authorized personnel".	—
5.2.4 Inspection covers and floor plates Inspection covers and floor plates shall be provided with a control device according to Table 6 n).	6.1.7.3/6.2.7.3 Access to Interior. Reasonable access to the interior of the escalator/moving walk shall be provided for inspection and maintenance.	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
It shall only be possible to open inspection covers and floor plates by a key or a tool suited for that purpose. If rooms behind inspection covers and floor plates can be entered, it shall be possible to open them from the inside without a key or a tool even when locked.	6.1.7.3.2/6.2.7.3.2 Access plates at the top and bottom landings shall be securely fastened by a mechanical means. 6.1.7.3.3/6.2.7.3.3 If access doors are provided in the side of the escalator/moving walk enclosure, they shall be locked. The key shall be removable only when in the locked position. The key shall be of group 2 security (see 8.1)	—
Inspection doors and trap doors shall be imperforate and conform to the same conditions as required for the location where they are installed..	6.1.7.3.1/6.2.7.3.1 Access plates requiring no more than 70 lbf (311 N) effort to open shall be provided at the top and bottom landing/both landings for inspection and maintenance. The plates shall be made of a material which will afford a secure foothold. The use of stone, terrazzo, or concrete as a fill material is prohibited in panels within the confines of the escalator truss.	—
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 rated load of 5 000 N/m². It shall be calculated in accordance with EN 1993-1-1. NOTE Load carrying area = (nominal width z_1 (see Figure 3) of the escalator or moving walk) × (distance l_1 between the supports) (see Figure 2).	6.1.3.9/6.2.3.10 Rated load <i>Rated loads are expressed in terms that apply to both linear and curved escalators.</i> 6.1.3.9.1 Structural. For the purpose of structural design, the rated load shall be considered to be not less than the following: (SI units) Structural rated load (kg) = D_1 (W +203) A/1 000 (Customary units) Structural rated load (lb) = D_2 (W +8) A/12	BSLJ-EO; Article 129-12 3. Carrying load for the escalators shall equal or exceed the values calculated by the following formula: $P = 2\,600 \text{ N/m}^2$ where: P is the carrying load for the escalator, in Newtons; A is the horizontal projected area of the steps of the escalators, in square meters.

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
	where: A = length of the horizontal projection of the entire truss measured along its centerline, m (ft); D_1 = loading factor = 270 kg/m²; D_2 = loading factor = 55.2 lb/ft²; W = width of the escalator, mm (in.) (see 6.1.3.2). 6.2.3.10.1 Structural. For the purpose of structural design, the rated load shall be considered to be not less than the following: (SI units) Structural rated load (kg) = $D_7 (W) A/1\ 000$ (Customary units) Structural rated load (lb) = $D_8 (W) A/12$ where: A = length of the horizontal projection of the entire truss measured along its centerline, m (ft); D_7 = loading factor = 490 kg/m²; D_8 = loading factor = 100 lb/ft²; W = width of the moving walk, mm (in.) (see 6.2.3.2.1 and 6.2.3.7). 6.2.3.10.2 Machinery (a) For the purpose of driving machine and power transmission calculations, the rated load for all single driving machines shall be considered to be not less than the following: (SI units) Machinery rated load (kg) = $D_9 (W) C_1/1\ 000$ (Imperial units) Machinery rated load (lb) = $D_{10} (W) C_1/12$ (b) The rated load per module for two or more modular driving machines shall be considered to be not less than the following:	MOC-N (No.1418-2000) 2(2) (2) In the Art.129-12, item 2, the safety factor of step, frame, and truss or beam stipulated in Art.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. b. Truss or beam JEAS-1003B, <i>Escalator specifications.</i> JEAS-1004B, <i>Structural calculation for escalator.</i>

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
	(SI units) Machinery rated load (kg) = $D_9 (W)$ $C_2/1\ 000$ (Imperial units) Machinery rated load (lb) = $D_{10} (W)$ $C_2/12$ where: C_1 = length of exposed treadway, m (ft); C_2 = length of exposed treadway per module, m (ft); D_9 = loading factor = 370 kg/m²; D_{10} = loading factor = 75.0 lb/ft²; W = width of the moving walk, mm (in.) (see 6.2.3.2.1 and 6.2.3.7).	
—	6.2.3.9 Supporting structure 6.2.3.9.1 Supports Supports shall conform to the following: ... (b) <i>Roller-Bed Type</i>. Where the treadway is supported on a series of rollers, the combination of roller spacing, belt tension, and belt stiffness shall be such that the deflection of the treadway surface, midway between rollers, shall not exceed the quantity 0,25 mm (0,094 in.) plus 0,004 times the centre-to-centre distance of rollers in mm (in.) when measured as follows. (1) The treadway surface shall be loaded midway between rollers with 11,3 kg (25 lb) weight concentrated on a cylindrical foot piece 50 mm (2 in.) long by 25 mm (1 in.) in diameter placed with its long axis across the belt. Deflection of this foot piece from its unloaded position shall not exceed the figure obtained above. (2) The rollers shall be concentric and true running within commercially acceptable tolerances. (d) <i>Pallet Type</i>. Pallet wheel tracks shall be so designed and located as to prevent more than 3 mm (0,125 in.) vertical displacement of the treadway should the pallet connection means break.	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes																				
Based on passenger weight, the maximum calculated or measured deflection shall not exceed 1/750 of the distance between supports l_1 .	—	—																				
Comparison of loads between EN 115 and A 17.1 A 17.1 recognizes that fewer passengers can be placed on a moving escalator than can be accommodated on a stationary one. Therefore, two different rated loads are defined, one for the structural support, and one for the machinery that moves the passengers. The rated load is expressed differently in the two codes, but the table below shows the comparison in the same format, N/m of length. This is required since the width factor for the load carrying area in A 17.1 is the step width plus a constant. <table><tr><th colspan="4">Rated load in N/m of length</th></tr><tr><th>Step width</th><th>600 mm</th><th>800 mm</th><th>1000 mm</th></tr><tr><td>EN 115</td><td>3 000 N/m</td><td>4 000 N/m</td><td>5 000 N/m</td></tr><tr><td>A 17.1 (Structural)</td><td>2 202 N/m</td><td>2 753 N/m</td><td>3 304 N/m</td></tr><tr><td>A 17.1 (Machinery)</td><td>1 675 N/m</td><td>2 095 N/m</td><td>2 514 N/m</td></tr></table>		Rated load in N/m of length				Step width	600 mm	800 mm	1000 mm	EN 115	3 000 N/m	4 000 N/m	5 000 N/m	A 17.1 (Structural)	2 202 N/m	2 753 N/m	3 304 N/m	A 17.1 (Machinery)	1 675 N/m	2 095 N/m	2 514 N/m	
Rated load in N/m of length																						
Step width	600 mm	800 mm	1000 mm																			
EN 115	3 000 N/m	4 000 N/m	5 000 N/m																			
A 17.1 (Structural)	2 202 N/m	2 753 N/m	3 304 N/m																			
A 17.1 (Machinery)	1 675 N/m	2 095 N/m	2 514 N/m																			
(5.2.6)	6.1.3.7 Trusses or girders. The truss or girder shall be designed to safely sustain the steps and running gear in operation. In the event of failure of the track system, it shall retain the running gear within the confines of this truss. Where tightening devices are operated by means of tension weights, provision shall be made to retain these weights in the truss if they should be released.	—																				
5.3 Steps, pallets, belt 5.3.1 General In the user carrying area of the escalator, the step treads shall be horizontal with a tolerance of $\pm 1^\circ$ in the direction of travel. NOTE 1 The maximum permissible height between two consecutive steps at the landings is defined in 5.3.4 and 5.7.2.1. Tread surfaces for escalators and moving walks shall provide a secure foothold. NOTE 2 For definition of materials and test methods, see Annex J.	6.1.3.5.1 Material and type (c) Step treads shall be horizontal and shall afford a secure foothold. The step supporting system shall be so designed so that the back of the step cannot tip upward more than 6 mm (0,25 in.) at any point. 6.2.3.5.5 Material and type (c) Pallet treads shall afford a secure foothold.	—																				

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
—	6.1.3.5.1/6.2.3.5.5 Material and type (a) Step/pallet frames, treads, risers, and dynamic skirt panels excluding the step's/their attachments or inserts, shall be metal, except that magnesium alloys shall not be used or the materials in their end-use configuration shall have a flame spread index of 0 to 50 based on the tests conducted in accordance with the requirements of ASTM E 84, UL 723, NFPA 255, or CAN/ULC-S102.2, whichever is applicable (see Part 9). (b) Nonmetallic attachments and inserts (excluding wheels) shall be classified 94 HB or better in accordance with ANSI/UL 94.	—
—	6.1.3.5.8/6.2.3.5.6 Step/pallet wheels. Where support wheels attached to the steps/pallets are not located within the width of the step/pallet, provision shall be made to prevent the step/pallet from falling into the escalator/moving walk interior due to a loss of one or more of the support wheel assemblies.	—
5.3.2 Dimensions 5.3.2.1 General For escalators and moving walks, the nominal width, z_1, shall be not less than 0,58 m and not exceed 1,10 m. For moving walks with an angle of inclination up to 6°, widths up to 1,65 m are permitted.	6.1.3.5.2 Dimensions of steps. The depth of any step tread in the direction of travel shall be not less than 400 mm (15,75 in.), and the rise between treads shall be not more than 220 mm (8,5 in.). The width of a step tread shall be not less than 560 mm (22 in.) nor more than 1 020 mm (40 in.). (see Nonmandatory Appendix I, Fig. I-7.) 6.2.3.7 Width. The width of a moving walk (see 6.2.3.2.1) shall be not less than 560 mm (22 in.). The maximum width shall depend both on the maximum slope at the point on the treadway and on the treadway speed. The width shall not exceed the value shown in Table 6.2.3.7.	BSLJ-EO; 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. BSLJ-EO; Article 129-12 EXP 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 center of the handrail at the said side of the steps shall be not more than 25 cm (i.e. distance between handrails is no more than 1,6 m) The width of the steps for moving walk with inclination less than 4° is less than 1,6 m and distance from side edge of step to centre of handrail is not more than 0,25 m (i.e. distance between handrails is not more than 2,1 m).

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
		(MOC-N(No.1413-2000) 2-2.) 2. The escalators of the special construction or the special use form to which the provisions described in the Art.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) The escalator of which step tread width exceeding 1,1 m. <i>In addition to conforming to the provisions stipulated in the Art. 129-12, item 1, paragraph 1, 3, and 4, it shall conform to the construction specified as follows.</i> (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. (3) The escalator of which speed varies in halfway of travel. (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.
5.3.2.2 Step treads and pallets (see Figure 2, detail X, and Figure 5) 5.3.2.2.1 The step height, x_1, shall not exceed 0,24 m. 5.3.2.2.2 The step depth, y_1, shall be not less than 0,38 m.	6.1.3.5.2 Dimensions of steps. The depth of any step tread in the direction of travel shall be not less than 400 mm (15,75 in.) and the rise between treads shall be not more than 220 mm (8,5 in.). The width of a step tread shall be not less than 560 mm (22 in.) nor more than 1 020 mm (40 in.) (see Nonmandatory Appendix I, Fig. I-7).	2. The escalators of the special construction or the special use form to which the provisions described in the Art.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°. <i>In addition to conforming to the provisions stipulated in the Art. 129-12, item 1, paragraph 1, 3, and 4, it shall conform to the construction specified as follows.</i> (d) It shall be that the depth of the step is more than 35 cm.

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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 Slotting of step treads/treadway. The tread/treadway surface of each step/pallet shall be slotted in a direction parallel to the travel of the steps/to its travel.	—
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 Cleated step risers. The step riser shall be provided with vertical cleats which shall mesh with slots on the adjacent step tread wherever the steps are exposed (see Nonmandatory Appendix I, Fig. I-8).	—
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 Slotting of step treads. Each slot shall be not more than 6,5 mm (0,25 in.) wide and not less than 9,5 mm (0,375 in.) deep and the distance from centre to centre of adjoining slots shall be not more than 9,5 mm (0,375 in.). 6.2.3.5.1 Slotting of treadway. Each slot shall be not more than 6,5 mm (0,25 in.) wide at the treadway surface and not less than 9,5 mm (0,375 in.) deep and the distance from centre to centre of adjoining slots shall be not more than 9,5 mm (0,375 in.). Sides of the slots shall be permitted to slope for mould draft purposes and shall be permitted to be filleted at the bottom (see Nonmandatory Appendix I, Fig. I-10).	—
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 Slotting of step treads. ... Slots shall be so located on the step tread surface as to form a cleat on each side of the step tread adjacent to the skirt or dynamic skirt panel (see Nonmandatory Appendix I, Fig. I-7). 6.2.3.5.1 Slotting of treadway. ... Slots shall be so located on each side of the pallet to form a cleat adjacent to the skirt panel (see Nonmandatory Appendix I, Fig. I-10).	—
5.3.2.2.9 The edge between the surface of the step tread and the riser shall have any sharpness relieved.	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
5.3.2.3 Belts (see Figure 2, 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 Slotting of treadway. The treadway surface shall be slotted in a direction parallel to its travel for purposes of meshing with combplates at the landings. Each slot shall be not more than 6,4 mm (0,25 in.) wide at the treadway surface and not less than 4,8 mm (0,188 in.) deep and the distance from centre to centre of adjoining slots shall be not more than 13 mm (0,50 in.). Sides of slots shall be permitted to slope for mould draft purposes and shall be permitted to be filleted at the bottom. Slots shall be so located on each side of the belt to form a cleat adjacent to the skirt panel.	—
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 Slotting of treadway. Slots shall be so located on each side of the belt to form a cleat adjacent to the skirt panel. 6.2.3.6.1 Splices. splicing of the treadway belt shall be made in such a manner as to result in a continuous unbroken treadway surface of the same characteristics as the balance of the belt.	—
—	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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/m² NOTE 6 000 N/m² is derived from a static load of 5 000 N/m² (see 5.2.5) plus an impact factor of 1,2. To establish the dimensions of the belt and its supporting system, an area of effective width × 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 fixings 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 electric safety device [Table 6 g)].	6.1.3.9.4 Step. The step shall be designed to support a load of 135 kg (300 lb) on a 150 mm × 250 mm (6 in. × 10 in.) plate placed on any part of the step with the 250 mm (10 in.) dimension in the direction of step travel. 6.2.3.10.4 Pallet. The pallet shall be designed to support a load of 135 kg (300 lb) for each 0,42 m² (4.5 ft²) of area or part thereof. The load shall be applied on a 150 mm × 250 mm (6 in. × 10 in.) plate placed on any part of the pallet with the 250 mm (10 in.) dimension in the direction of step travel. If more than one load is required, they shall be located no closer than 910 mm (36 in.) to each other. 6.1.3.10.4/6.2.3.11.4 For steps/pallets, the factor of safety shall be 5 based on not less than the loads designated in 6.1.3.9.4/6.2.3.10.4.	(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, 2a) JEAS-1003B, <i>Escalator specifications.</i> JEAS-1004B, <i>Structural calculation for escalator.</i>
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 × 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.	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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 is to 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.		
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 normal to the surface on an area of 25 cm² using a square or round steel plate minimum thickness 25 mm shaped to fit the risers curvature. This load shall be applied in three positions across the width of the riser on the centre line, in the middle, and at both ends. There shall be no permanent deformation.	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
5.3.3.2.3 Pallets The pallet shall be tested for deflection with a single force which, for a pallet area of 1 m², shall be 7 500 N (including weight of the plate). The force shall be applied perpendicular to the tread surface on a steel plate 0,30 m × 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 × 0,30 m and its thickness be not less than 25 mm. For pallets with a depth smaller than 0,30 m, the plate width shall be 0,20 m and the length of the plate shall be the depth of the pallet. During this test, the deflection measured at the tread surface shall be not more than 4 mm. There shall be no permanent deformation (initial setting tolerances are permitted). The pallet shall be tested as a whole together with rollers (not rotating), axles, or stub shafts (if existing) in a horizontal position. A test of the installed pallet, i.e. together with the guide rails and the supporting structure of the moving walk, is not required.	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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 × 0,25 m × 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 8).	6.2.3.9.1 Supports. Supports shall conform to the following: (c) <i>Edge-supported belt type.</i> When the treadway belt is transversely rigid and is supported by rollers along its edges, the following requirement shall apply: (1) With the belt tensioned through the take-up system, the permissible slope of a straight line from the top of a treadway rib adjacent to the centerline of the treadway to the top of a treadway rib adjacent to the balustrade in a plane perpendicular to the path of the treadway shall not exceed 3 % when the treadway is loaded with a 68 kg (150 lb) weight on a 150 mm × 250 mm (6 in. × 10 in.) plate located on the centerline of the treadway with the 250 mm (10 in.) dimension in the direction of treadway travel.	—
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 is to 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 × 10⁶ 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 × 0,30 m in size and at least 25 mm thick arranged as specified	6.1.3.5.7 Step fatigue tests. Each step width shall be subjected to the step fatigue test as described in 8.3.11. 8.3.11 Step and pallet fatigue engineering test Step fatigue tests required in 6.1.3.5.7 and pallet fatigue tests required by 6.2.3.5.4 shall be performed as indicated in 8.3.11.1 through 8.3.11.6. 8.3.11.1 The test shall be made at either the manufacturer's facility or at a testing laboratory. 8.3.11.2 Escalator steps shall be mounted in an arrangement that duplicates the conditions on the escalator incline and their attachment to the step chain.	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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.	8.3.11.3 The steps shall be subjected to a load varying from 450 N (100 lbf) to 3 000 N (650 lbf) at a frequency of 10 Hz $\pm$ 5 Hz for 5 000 000 cycles. An undisturbed harmonic force flow shall be achieved. 8.3.11.4 The load shall be applied normal to the tread surface to a plate 25 mm (1 in.) thick, 200 mm (8 in.) wide, and 300 mm (12 in.) long, located at the centre of the step or pallet with the 300 mm (12 in.) dimension in the direction of step travel. 8.3.11.5 The step or pallet shall have no fractures or permanent tread surface deflection exceeding 4 mm (0,16 in.) following the completion of the test. The deflection of 4 mm (0,16 in.) does not include any set or wear in the supporting wheels. 8.3.11.6 This test is to be performed on each step or pallet width.	
5.3.3.3.1.2 Torsional test The step design shall be such that the structure can accommodate torsional loading equivalent to a ± 2 mm displacement of the trailer wheel centre moving in an arc whose centre is the chain wheel centre. The ± 2 mm displacement is a relative to a trailer wheel to chain wheel centre distance of 400 mm. This ratio shall be maintained when the 400 mm dimension is varied (see Annex F for test examples). The dynamic test shall be adjustable to ensure that the specified deflections above are achieved throughout the test. It shall be applied with one frequency between 5 Hz and 20 Hz for at least 5×10^6 cycles, whereby an undisturbed sinusoidal force flow shall be achieved. After the test, the step shall show no indication of crack initiation. Permanent deformation shall not be greater than 4 mm measured at the tread surface. Steps or their component parts, e.g. inserts or fixings, shall be securely attached and not become loose.	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
5.3.3.3.2 Pallets 5.3.3.3.2.1 Load test The pallet, irrespective of its size, shall be tested in a horizontal position together with rollers (not rotating), axles, or stub shafts (if existing). It shall be subjected to a load pulsating between 500 N and 3 000 N at one frequency between 5 Hz and 20 Hz for at least 5×10^6 cycles, whereby an undisturbed sinusoidal force flow shall be achieved. It shall be applied perpendicular to the tread surface on a steel plate 0,20 m $\times$ 0,30 m in size and at least 25 mm thick, in the centre of the tread surface. For pallets with a smaller length than 0,30 m, the plate width shall be 0,20 m and the length of the plate shall be the length of the pallet. After the test, the pallet shall show no indication of crack initiation. Permanent deformation shall not be greater than 4 mm measured at the tread surface. Pallets or their component parts, e.g. inserts or fixings, shall be securely attached and not become loose. If rollers are damaged during the test, it is permissible to replace them.	6.2.3.5.4 Pallet fatigue tests. Each pallet width shall be subjected to the pallet fatigue test as described in 8.3.11. 8.3.11 Step and pallet fatigue engineering test. Step fatigue tests required in 6.1.3.5.7 and pallet fatigue tests required by 6.2.3.5.4 shall be performed as indicated in 8.3.11.1 through 8.3.11.6. 8.3.11.1 The test shall be made at either the manufacturer's facility or at a testing laboratory. 8.3.11.2 Moving walk pallets shall be mounted in an arrangement that duplicates the condition of a horizontal moving walk and their attachment to the pallet chain. 8.3.11.4 The load shall be applied normal to the tread surface to a plate 25 mm (1 in.) thick, 200 mm (8 in.) wide, and 300 mm (12 in.) long located at the centre of the step or pallet with the 300 mm (12 in.) dimension in the direction of step travel. 8.3.11.5 The step or pallet shall have no fractures or permanent tread surface deflection exceeding 4 mm (0.16 in.) following the completion of the test. The deflection of 4 mm (0.16 in.) does not include any set or wear in the supporting wheels. 8.3.11.6 This test is to be performed on each step or pallet width.	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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 5×10^6 cycles, whereby an undisturbed sinusoidal force flow shall be achieved. For pallets with a smaller length than 0,30 m, the plate width shall be 0,20 m and the length of the plate shall be the length of the pallet. After the test, the pallet shall show no indication of crack initiation. Permanent deformation shall not be greater than 4 mm measured at the tread surface. Pallets or their component parts, e.g. inserts or fixings, shall be securely attached and not become loose.	—	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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.	6.1.3.8 Step wheel tracks Step wheel tracks shall be designed so as to prevent displacement of the steps and running gear if a step chain breaks. (3) <i>Edge supported belt</i>. When the treadway belt is transversely rigid and is supported by rollers along its edges, the following requirement shall apply: (a) with the belt tensioned through the take-up system, the permissible slope of a straight line from the top of a treadway rib adjacent to the centerline of the treadway to the top of a treadway rib adjacent to the balustrade in a plane perpendicular to the path of the treadway shall not exceed 3 % when the treadway is loaded with a 150 lb (68 kg) weight on a 6 in. (152 mm) by 10 in. (254 mm) plate located on the centerline of the treadway with the 10 in. (254 mm) dimension in the direction of treadway travel.	—
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.	6.2.3.9.1 Supports. Supports shall conform to the following: (c) <i>Edge-supported belt type</i>. When the treadway belt is transversely rigid and is supported by rollers along its edges, the following requirement shall apply: ... (2) in order to support the treadway in case of localized overload, supports shall be supplied at intervals, not exceeding 1 830 mm (72 in.) along the centerline of the treadway. The supports shall be located at a level not more than 50 mm (2 in.) below the underside of the treadway when it is loaded under test conditions required by 6.2.3.9.1(c)(1).	—
—	—	—
—	—	—
—	—	—
—	6.2.3.5.3 Alignment of pallet tread surfaces. Adjacent ends of pallets shall not vary in elevation more than 1,6 mm (0,06 in.).	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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 2, details Y, Z; Figure 6, detail S; and Figure 7, detail U). 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 7, detail V).	6.1.3.5.4 Clearance between steps. The maximum clearance between step treads on the horizontal run shall be 6 mm (0,25 in.) (see Nonmandatory Appendix I, Fig. I-6). 6.2.3.5.2 Intermeshing pallets. Alternate cleats on adjacent pallets shall intermesh so that there is no continuous transverse gap between adjacent pallets.	MOC-N (No.1413-2000) 2. The escalators of the special construction or the special use form to which the provisions described in the Art.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. (3) The escalator of which speed varies in halfway of travel. It shall conform to the construction specified as follows. (b) It shall be that the clearance between the side edge of the step and skirt guard panel is not more than 5 mm. (c) It shall be that the clearance between the adjacent steps is not more than 5 mm. MOC-N (No.1417-2000) (2) It shall be that the clearance between the side edge of the step and skirt guard panel is not more than 5 mm. (3) It shall be that the clearance between the adjacent steps is not more than 5 mm. JIS A 4302-2006; 5.4.2(h) ≤ 5 mm JIS A 4302-2006 5.4.2 (k) Demarcation shall be provided to highlight.
5.3.6 Missing step or pallet device A missing step/pallet [see Table 6 k)] 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 device provided at each driving and return station.	6.1.6.5 Missing step/pallet and missing dynamic skirt devices (a) A device shall be provided to detect a missing step/pallet and bring the escalator/moving walk to a stop before the gap resulting from the missing step/pallet emerges from the comb. The device shall cause power to be removed from the driving-machine motor and brake. The device shall be of the manual-reset type.	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
—	(b) For escalators with dynamic skirts, a device shall be provided to detect a missing dynamic skirt panel and bring the escalator to a stop before the gap resulting from the missing dynamic skirt panel emerges from the balustrade. The device shall cause power to be removed from the driving-machine motor and brake. The device shall be of the manual-reset type.	—
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 Driving motor An electric motor shall not drive more than one escalator/moving walk driving machine. A driving machine shall not operate more than one escalator/moving walk.	—
5.4.1.2 Speed 5.4.1.2.1 The nominal speed shall not deviate by more than $\pm 5\%$ at nominal frequency and nominal voltage. 5.4.1.2.2 The nominal speed of the escalator shall not exceed to the following: - 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 Rated Speed 6.1.4.1 Limits of speed. 6.1.4.1.1 The rated speed shall be not more than 0,5 m/s (100 ft/min) measured along the centerline of the steps in the direction of travel. The speed attained by an escalator after start-up shall not be intentionally varied, except as permitted by 6.1.4.1.2. 6.1.4.1.2 Variation of the escalator speed after start-up shall be permitted provided the escalator installation conforms to all of the following: (a) the acceleration and deceleration rates shall not exceed 0.3 m/s^2 (1,0 ft/sec ²); (b) the rated speed is not exceeded; (c) the minimum speed shall be not less than 0,05 m/s (10 ft/min); (d) the speed shall not automatically vary during inspection operation; (e) passenger detection means shall be provided at both landings of the escalator such that (1) detection of any approaching passenger shall cause the escalator to accelerate to or maintain the full	JIS A 4302-2006, 5.4.1 (b) The measured speed shall be not exceed 110 % of nominal speed under no load condition at landing. BSLJ-EO (Construction 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 Art.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 Art.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.

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
	escalator speed conforming to 6.1.4.1.2(a) through (d); (2) detection of any approaching passenger shall occur sufficiently in advance of boarding to cause the escalator to attain full operating speed before a passenger walking at normal speed [1,35 m/s (270 ft/min)] reaches the combplate; (3) passenger detection means shall remain active at the egress landing to detect any passenger approaching against the direction of escalator travel and shall cause the escalator to accelerate to full rated speed and sound the alarm (see 6.1.6.3.1) at the approaching landing before the passenger reaches the combplate; (f) automatic deceleration shall not occur before a period of time has elapsed since the last passenger detection that is greater than three times the amount of time necessary to transfer a passenger between landings; (g) means shall be provided to detect failure of the passenger detection means and shall cause the escalator to operate at full rated speed only.	EXP. 2.(1) Rated speed is stipulated corresponding to inclination [see Table C.6 in the Annex of this comparison] MOC-N (No.1417-2000) EXP. 2.(1) and (2) Rated speed is stipulated corresponding to inclination. [see Table C.7 in the Annex of this comparison]
5.4.1.2.3 The nominal speed of moving walks shall be not higher than 0,75 m/s. Deviating from 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.	6.2.4 Rated speed The maximum speed of a treadway shall depend on the maximum slope at any point on the treadway. The speed shall not exceed the value determined by Table 6.2.4. The speed attained by a moving walk after startup shall not be intentionally varied, except as permitted by 6.2.4.1.2.	MOC-N (No.1417-2000) EXP. 2.(1) &(2) Rated speed is stipulated corresponding to inclination. [see Table C.8 in the Annex of this comparison]

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
	Table 6.2.4 – Treadway speed max. treadway slope/max. speed m/s (ft/min) 0° to 8°/0,9 (180) Above 8° to 12°/0,7 (140) 6.2.4.1.2 Variation of the moving-walk speed after start-up shall be permitted provided the moving walk installation conforms to all of the following: (a) the acceleration and deceleration rates shall not exceed 0.3 m/s² (1.0 ft/sec²); (b) the rated speed is not exceeded; (c) the minimum speed shall be not less than 0,05 m/s (10 ft/min); (d) the speed shall not automatically vary during inspection operation; (e) passenger detection means shall be provided at both landings of the moving walk such that (1) detection of any approaching passenger shall cause the moving walk to accelerate to or maintain the full moving walk speed conforming to 6.2.4.1.2(a) through (d); (2) detection of any approaching passenger shall occur sufficiently in advance of boarding to cause the moving walk to attain full operating speed before a passenger walking at normal speed [1,35 m/s (270 ft/min)] reaches the combplate; (3) passenger detection means shall remain active at the egress landing to detect any passenger approaching against the direction of moving walk travel and shall cause the moving walk to accelerate to full rated speed and sound the alarm (see 6.2.6.3.1) at the approaching landing before the passenger reaches the combplate; (f) automatic deceleration shall not occur before a period of time has elapsed since the last passenger detection that is greater than three times the amount of time necessary to transfer a passenger between landings; (g) means shall be provided to detect failure of the passenger detection means and shall cause the moving walk to operate at full rated speed only.	

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
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.	—	MOC-N (No.1413-2000) 2. The escalators of the special construction or the special use form to which the provisions described in the Art.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. (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 50m/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, and 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 Driving machine, motor, and brake 6.1.5.1/6.2.5.1 Connection between driving machine and main drive shaft. The driving machine shall be connected to the main drive shaft by toothed gearing, a mechanical coupling, or a chain. 6.1.5.3/6.2.5.3 Brakes 6.1.5.3.1/6.2.5.3.1 Escalator/moving walk driving-machine brake (e) Where means other than a continuous shaft, mechanical coupling, or toothed gearing is used to connect the motor to a gear reducer, the escalator/moving walk driving-machine brake shall be located on the gear reducer or main drive shaft.	—
(5.4.1.3.1.1)	6.2.3.13 Chain drives. Chain drives shall be of the type covered by ASME B29.1M and ANSI/SAE SP-68. When operating at the machinery rated load, the load imposed on such chains shall not exceed the horsepower rating established by these standards. The loading shall be considered to be uniform and the service to be 24 h per day.	—

EN 115-1 (Europe)	A17.1/B44 (North America)	Japanese codes
(5.4.1.3.1.2)	6.2.3.14 V-belt drives. The load imposed on v-belt drives when operating at the machinery rated load shall not exceed the horsepower rating as established by ANSI/RMA IP-20. The loading shall be considered to be uniform and the service to be 24 hr per day.	—
5.4.1.3.2 Safety factors of all driving elements shall be at least five for static calculations. In the case of trapezoidal belts, at least three 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 rated load (person weight) 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.	6.1.3.10/6.2.3.11 Design factors of safety. Factors of safety are based on either single driving-machine design or modular driving-machine design. The factors of safety shall be at least the following/as specified in 6.2.3.11.1 through 6.2.3.11.5. 6.1.3.10.1/6.2.3.11.1 Trusses and all supporting structures including tracks, shall conform to the AISC specifications for design, fabrication, and erection of structural steel for buildings or the CSA standard CAN/CSA-S16.1, whichever is applicable (see Part 9) based on the maximum static load calculated per 6.1.3.9.1/6.2.3.10.1. 6.1.3.10.2/6.2.3.11.2 For driving-machine parts based on not less than the loads calculated per 6.1.3.9.2/6.2.3.10.2: (a) where made of steel or bronze, the factor of safety shall be eight; (b) where made of cast iron or other materials, the factor of safety shall be 10.	Refer to 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, an electric safety device [see Table 6 q)] in conformity with 5.12.1.2.2 shall be actuated when or before the hand winding device is put on the machine. Crank handles or perforate hand wheels are not permitted.	—	—