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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 18298

Railway applications — Platform barrier systems

Applications ferroviaires — Systèmes façades de quai

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Foreword

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

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

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This document was prepared by Technical Committee ISO/TC 269, Railway Applications.

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

Introduction

0.1 Purpose

Platform barrier systems provide a movable barrier between trains and other guided transit vehicles, and passengers waiting at stations and boarding points.

Platform barrier systems are used increasingly on metro and other rail networks to ensure the safety of passengers on the station platform who are waiting to board vehicles. Such systems are also used on “people-mover” guided systems for short-distance transits, for example at airports. Their use is recommended by IEC 62267 for any fully automated transit system.

In particular platform barrier systems can be used to control the risk of:

- incursion by passengers or other persons on the railway track (deliberate or accidental); and
- contact between passengers and moving vehicles.

These risks can be especially significant where there is the possibility of overcrowding on station platforms at busy locations. Barriers may increase the safely useable space in the station for passengers waiting and circulating on the platforms.

Platform barrier systems integrate the operation of the platform barrier doors and gates with opening and closing of train doors and also assist in the management of station operations, to safely permit higher speeds for trains entering and exiting the stations.

Barrier installations can also be part of a continuous partition between the running tracks and the station areas for the purposes of:

- fire safety (including smoke management);
- tunnel and station ventilation (including reduction of the piston effect);
- trackside noise reduction; and
- passenger comfort at climate-controlled stations.

Additionally, the terminology used in connection with platform barrier systems, in particular to improve the specification and understanding of safety requirements, should be standardized.

0.2 National annex with relevant national standards

There are several standards required for the successful implementation of this document, relating to specific regions or countries, that are currently not suitable for inclusion within an international standard. As such, national standards bodies are encouraged to compile and document the standards, relevant to the region or country they represent, within a national annex. National annexes can also provide localised guidance and advice on how to implement this document for projects of varying complexity.

Railway applications — Platform barrier systems

1 Scope

This document specifies requirements for the design, construction and operation of platform barrier systems positioned at the edge of a station platform immediately adjacent to the rail or other guided vehicles in stations and boarding points for passenger services. This document includes:

- requirements for the fixed structure and fixed parts along the platform;
- physical requirements for the movable doors and gates normally used by passengers;
- requirements for emergency doors;
- requirements for driver access doors;
- requirements for platform extremity doors; and
- requirements for the management of safety risks that are particular to barrier systems.

Note this standard provides normative requirements for doors and gates on conventional panel construction from platform level to the top of the door, or gate.

This document also gives requirements for the integration of barriers within the overall rail system, including:

- synchronization of vehicle and platform barrier doors/gates;
- audible and visible alerts;
- integrity of control systems;
- testing of the barrier installation;
- operational performance; and
- requirements relating to other interfacing sub-systems, notably signalling and vehicles.

This document does not cover barrier systems set back from the platform edge, which are used to control access to trains or for crowd management, however, relevant sections of the document could be used as guidance.

This document applies to rail services, e.g. metro, tram systems and *heavy rail* (potential to change subject to TC269 WG10) services as requested by a project specification. It applies to small systems, working in conjunction with a single vehicle, or with larger systems working with a complete train.

This document applies to platform barrier systems used at sub-surface stations, enclosed surface stations (e.g. those enclosed for the purposes of providing an air-conditioned environment for waiting passengers), and those fully in the open-air.

This document applies to all persons involved in the implementation and system integration of a platform barrier system, including infrastructure owners, designers, installers and operators.

This document does not cover barrier systems using doors/gates that utilize multiple panels, bars, ropes, etc. or which operate in a vertical direction.

This document does not cover normative requirements:

- relating to fire performance or fire requirements arising from use of platform barrier systems as fire barriers; or
- for platforms, or other foundations and structures to which the barrier system is secured.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12543-1, *Glass in building — Laminated glass and laminated safety glass — Part 1: Vocabulary and description of component parts*

ISO 29584, *Glass in building — Pendulum impact testing and classification of safety glass*

IEC 62236-4, *Railway applications - Electromagnetic compatibility - Part 4: Emission and immunity of the signalling and telecommunications apparatus*

IEC 62128-1:2013, *Railway applications - Fixed installations - Electrical safety, earthing and the return circuit - Part 1: Protective provisions against electric shock*

IEC 62128-2, *Railway applications. Fixed installations. Electrical safety, earthing and the return circuit. Provisions against the effects of stray currents caused by d.c. traction systems*

IEC 62278, *Railway applications — The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS)*

IEC 62279, *Railway applications - Communication, signalling and processing systems - software for railway control and protection systems*

IEC 62425, *Railway applications - Communication, signalling and processing systems - Safety related electronic systems for signalling*

IEC 60364-4, *41, Low-voltage electrical installations — Part 4-41: Protection for safety — Protection against electric shock*

IEC 60364-5, *54, Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors*

IEC 60364-6, *Low-voltage electrical installations - Part 6: Verification*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61000-6, *2, Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments*

IEC 61000-6, *4, Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments*

IEC 61140, *Protection against electric shock - Common aspects for installation and equipment*

IEC 62061, *Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems*

IEC 62290-2:2014, *Railway applications - Urban guided transport management and command/control systems - Part 2: Functional requirements specification*

IEC 62305-1, *Protection against lightning - Part 1: General principles*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1

correct alignment

correct position of the doors of the vehicle relative to the corresponding platform barrier doors/gates, to permit safe and efficient transfer of passengers between vehicles and platform

3.2

closed and locked

status of doors/gates, which is closed and kept closed through a locking device (via mechanical or other means)

3.3

doorway

section of a platform barrier through which passengers can board or alight from vehicles when platform doors/gates are open

3.4

driver access door/gate

openable panel in a platform door or gate system designed to align with the driving cab door of a train stopped at the station or boarding point

Note 1 to entry: Such panels (if provided) can open with a hinged or sliding action.

3.5

emergency egress device

operating element for manual opening from the trackside, in case of emergency, of any type of platform door or gate

3.6

emergency egress door/gate

panel in a platform door or gate system which can be opened in an emergency, or if the vehicle(s) are not in correct alignment with the platform doors/gates

Note 1 to entry: Emergency egress doors/gates can be of any design - hinged/sliding/push-out, etc.

3.7

entrapment

trapping of a person between the vehicle bodyside and the platform barrier after the vehicle and platform doors/gates have been closed

3.8

façade

complete framework and panels (fixed and moving) of the platform barrier

3.9

finished floor level

level of the platform floor when all surface finishes (e.g. tiles, screed, threshold) have been applied

3.10

glazing

glass or equivalent transparent material fixed in frames as part of a platform barrier system

3.11

leading edge

vertical edge of a door or gate, leading during closing movement

3.12

local control panel

centralized control panel adjacent to or in the vicinity of the platform barrier which enables opening and closing of a complete set of doors/gates in a barrier system by operations staff

3.13

mechanical gap filler

movable device mounted at the platform edge, at a platform door or gate, fully automatic and actuated/controlled in conjunction with the barrier system opening/closing sequences

Note 1 to entry: The purpose of a mechanical gap filler is to reduce the horizontal stepping distance to a vehicle to acceptable limits, or to facilitate access to a vehicle by persons with reduced mobility. Its structural integrity does not rely on support from the vehicle.

3.14

operations staff

persons including train crew and station personnel authorized to perform tasks concerning train operation or direct service to passengers

3.15

passive gap filler

strips, of frangible or partly flexible material at a doorway threshold such that the clearance between a moving vehicle and the threshold can be safely reduced below that normally specified for gauge clearance between infrastructure and vehicles

3.16

person with reduced mobility (PRM)

person whose mobility when using transport is reduced due to any physical disability (sensory or locomotory, permanent or temporary), intellectual disability or impairment, or any other cause of disability, or as a result of age, and whose situation needs appropriate attention and adaptation to his or her particular needs of the service made available to all passengers

[SOURCE: EU Directive 2007/1371/EC]

Note 1 to entry: this population covers as well persons of small stature, elderly ones, pregnant women, persons carrying heavy luggage or accompanied by children (including children in strollers).

3.17

platform

section of pathway, alongside tracks at a railway, metro or other guided transit system station at which passengers can board or alight from vehicles

3.18

platform barrier system (PBS)

system providing a protective barrier between vehicle and platform, having power operated movable panels with associated drive and control equipment, such panels moving horizontally and parallel with edge of the platform, allowing passenger transfer through the barrier when a train is positioned at the platform

3.19

platform door

movable panel or panels and forming part of a platform door system through which passengers normally access and egress vehicles

3.20

platform door system

platform barrier system in which the movable panels are carried on a portal structure having headers or lintels above the moving panels, carrying all or part of their weight

Note 1 to entry: Such a system can form part of a structure completely enclosing the platform area and separating it entirely from the track on which vehicles move.

3.21

platform extremity door/gate

panel at the extremity of a platform door or gate system (usually, but not necessarily, at right angles to the main structure) to allow access by authorized persons to the track, or to a tunnel walkway beyond the station, or as emergency egress for persons evacuating from the track area

Note 1 to entry: Such panels can open with a hinged or sliding action.

Note 2 to entry: Platform extremity door/gates may not form part of the platform barrier system.

3.22

platform gate

movable panel or panels forming part of a platform gate system through which passengers normally access and egress vehicles

3.23

platform gate system

platform barrier system in which the movable panels are supported from the bottom, or by cantilever arrangement at an intermediate height on the barrier

3.24

routine test

conformity test made on each individual item of equipment during or after manufacture

3.25

station

unit comprising buildings and structures containing technical equipment, loading or unloading areas or platforms, and any associated areas for reception and shelter

3.26

synchronization of doors

co-ordinated movement of vehicle doors with platform doors/gates

3.27

system integration

process of assuring that the design, installation and operation of the barrier system is consistent with the overall safety and operational targets of the complete rail system, of which the barrier system is part

Note 1 to entry: The activity of system integration is elaborated on in [Annex C](#) (informative).

3.28

train

single self-propelled rail vehicle or a self-propelled group of physically coupled rail vehicles

[SOURCE: EN 17343:2020]

3.29

type test

conformity test made of one or more system and its components representative of the production to prove that the design meets the standard and the relevant specifications

3.30**user population**

range of persons (including operations staff) expected to use a platform barrier system, defined in terms of their physical characteristics

4 System design requirements**4.1 Physical and structural requirements of the platform barrier****4.1.1 General structural requirements**

4.1.1.1 Platform barrier systems form a safety barrier separating customers/passengers from moving trains until it is safe to grant access. As such they shall be designed to resist crowd loading. Platform barriers are also subject to aerodynamic loads induced by trains passing the structure. Platform barrier systems installed in open sections shall also resist wind loading. In addition, platform barrier systems can be subject to pressures generated by tunnel ventilation systems and can be required to resist earthquakes. These separate actions shall be combined in accordance with the relevant regional or national design standard(s) as described in the corresponding national annex, if any.

4.1.1.2 Tunnel ventilation systems can be associated with platform barrier systems that completely enclose the platform area, separating it from the track on which vehicles move. In this case, detailed modelling/simulation shall be undertaken during system integration and shall consider all operating and degraded modes of operation of the ventilation system to determine their effect on the platform barrier system and how they combine with the aerodynamic actions from trains. In particular, pressures generated by operation of ventilation systems for smoke extraction or fire management shall not inhibit operation of emergency doors in accordance with [4.1.7](#). The ventilation and aerodynamic loading values from the modelling/simulation shall form an input to the specification for the platform barrier system.

4.1.1.3 Structural design shall take into account the requirements arising from the physical interface with trains intended to operate in conjunction with the barrier system, in particular regarding entrapment ([4.1.10](#)) and gauging ([5.1.3](#)).

4.1.1.4 General construction of platform barriers shall be in accordance with the relevant regional or national design standard(s) related to structural requirements (e.g. imposed load combination{s}).

4.1.1.5 Specific consideration shall be given to the nature of railway platforms as areas susceptible to large crowds when applying the relevant regional or national design standard(s) that do not specifically cover platform barrier systems.

4.1.1.6 Consideration should be given to accidental loadings that a barrier system could sustain during its operation life such e.g. impact from electric wheelchair, machinery operated on the platform (for example floor cleaning machine), etc.

4.1.1.7 Deflection of the platform barrier system towards the track under any loading conditions as define in the relevant regional or national design standard(s) shall not exceed the limits defined by the gauging strategy for the platform barrier system as described in [5.1.3](#).

4.1.1.8 Infill panels (i.e. glazing, or sheets of other materials, which separate the platform area from the running tracks and are secured to the main structural framework of the barrier system) shall sustain the applied loads.

It is recommended that, in addition, deflection of an infill panel that is structurally safe should not alarm station users through large visible deformations relative to the frame in which the panel is mounted, when subject to normal service conditions. Therefore, for serviceability considerations, the limiting condition for deflection should be that the total horizontal displacement of the infill panel relative to the frame at any

point from its original unloaded position does not exceed the deflection limits determined from the relevant regional or national design standard(s) (where applicable) for the material used, or 25 mm, whichever is the smaller.

4.1.1.9 The calculations used in structural design shall be validated by load testing of a representative structure.

4.1.1.10 Load cases for the design and construction of the platforms, or other structures to which platform barrier systems are secured should be consistent with the load cases defined for the barrier system.

4.1.2 Structural design principles

4.1.2.1 Designs where steel or aluminium are used shall be in accordance with the relevant regional or national design standard(s).

4.1.2.2 In the event that structural materials other than steel or aluminium are used, performance of the design shall be demonstrated to be equivalent with the performance requirements of the relevant regional or national design standard(s) and specifically required crowd loading.

4.1.2.3 Where required by the relevant regional or national design standard(s) the platform barrier system design provide for earthquake resistance.

4.1.2.4 Where glass is used the thickness of the glazing material may be calculated using validated mathematical analysis. Alternatively, thickness may be determined using empirical national codes.

Use of empirical codes can result in conservative design and increased weight. Calculated methods are recommended where possible.

4.1.3 Structural loading conditions

4.1.3.1 Crowd loading

4.1.3.1.1 Design for horizontal crowd loading shall be in accordance with the relevant regional or national design standard(s).

4.1.3.1.2 The design value for crowd loading used should not be specified beyond that specified in the relevant regional or national structural design standard(s), for what is essential in foreseeable conditions. "Over-design" may result in increased volume and mass of moving and other parts with disadvantages for gauging and for safe and efficient motion of doors and gates.

4.1.3.2 Aerodynamic loading from trains

4.1.3.2.1 Aerodynamic loads arising from the movement of trains alongside platform barrier systems that completely enclose the platform area shall be considered in the structural design of the barrier. In such a case the platform area is completely separated from the track on which vehicles move (e.g. where separation is designed to support operation of a tunnel ventilation system, or climate control of the station). Such systems shall be fully analysed in accordance with the requirements of [4.1.1.2](#).

4.1.3.2.2 Aerodynamic loads arising from the movement of trains alongside platform barrier systems that do not fully enclose the platform area shall be considered in the structural design of the barrier. In such cases design loads may be calculated in accordance with the methodology in [Annex D](#) or be based on empirical measurement of comparable train and barrier combinations.