BS EN 16584-3:2017

BSI Standards Publication

Railway applications — Design for PRM use — General requirements

Part 3: Optical and friction characteristics

bsi.

National foreword

This British Standard is the UK implementation of EN 16584-3:2017.

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Applications ferroviaires - Conception destinée à l'usage par les PMR - Exigences générales - Partie 3 : Caractéristiques optiques et de friction

Bahnanwendungen - Gestaltung für die Nutzung durch PRM - Allgemeine Anforderungen - Teil 3: Optische Eigenschaften und Rutschfestigkeit

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 16584-3:2017) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

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

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57/EC.

For relationship with EU Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document.

This document is part of a suite of four ‘Design for PRM use’ standards that have in total nine parts:

— The EN 16584 series is a standard that covers both infrastructure and rolling stock — Railway applications — Design for PRM use — General requirements:

  — Part 1: Contrast (EN 16584-1);

  — Part 2: Information (EN 16584-2);

  — Part 3: Optical and friction characteristics (EN 16584-3).

— The EN 16585 series is a standard that covers rolling stock — Railway applications — Design for PRM use — Equipment and components on board rolling stock:

  — Part 1: Toilets (EN 16585-1);

  — Part 2: Elements for sitting, standing and moving (EN 16585-2);

  — Part 3: Clearways and internal doors (EN 16585-3).

— The EN 16586 series is a standard that covers rolling stock — Railway applications — Design for PRM use — Accessibility of persons with reduced mobility to rolling stock:

  — Part 1: Steps for access and egress (EN 16586-1);

  — Part 2: Boarding aids (EN 16586-2).

— EN 16587 is a standard that covers infrastructure — Railway applications — Design for PRM use — Requirements for obstacle free routes for infrastructure.

These standards aim to clarify the requirements (with clear and consistent terms and definitions) and to define the associated criteria and, where appropriate, methodologies to allow a clear pass/fail assessment.

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

1 Scope

This European standard describes the specific 'Design for PRM use' requirements applying to both infrastructure and rolling stock and the assessment of those requirements. The following applies to this standard:

— The definitions and requirements describe specific aspects of 'Design for PRM use' required by persons with disabilities and persons with reduced mobility as defined in the PRM TSI.

— This standard defines elements that are universally valid for obstacle free travelling including lighting, contrast, tactile feedback, transmission of visual and acoustic information. The definitions and requirements of this standard cover the infrastructure and rolling stock applications.

— This standard only refers to aspects of accessibility for PRM passengers it does not define non PRM related requirements and definitions.

— This standard assumes that the infrastructure or rolling stock is in its defined operating condition.

— Where minimum or maximum dimensions are quoted these are absolute NOT nominal requirements.

The 'General requirements' standard is written in three parts:

— Part 1 contains:

  — contrast.

— Part 2 contains:

  — spoken information;

  — written information;

  — tactile information;

  — pictograms.

— This document is Part 3 and contains:

  — lighting;

  — low reflective properties;

  — transparent obstacles;

  — slip resistance.

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.

EN 1838, *Lighting applications — Emergency lighting*

EN 12464 (series), *Light and lighting — Lighting of work places*

EN 13272:2012, *Railway applications — Electrical lighting for rolling stock in public transport systems*

EN 16584-1, *Railway applications — Design for PRM use — General Requirements — Part 1: Contrast*

EN 16584-2, *Railway applications — Design for PRM use — General Requirements — Part 2: Information*

prEN 16587:2013, *Railway applications — Design for PRM use — Requirements for Obstacle Free Routes for Infrastructure*

EN ISO 2813, *Paints and varnishes - Determination of gloss value at 20°, 60° and 85° (ISO 2813)*

ISO 4649, *Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*

ISO 21542, *Building construction — Accessibility and usability of the built environment*

3 Terms and definitions

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

3.1
contrast
perception of a difference visually between one surface or element of a building/rail vehicle and another by reference to their light reflectance values (LRV) or luminance values

Note 1 to entry: See BS 8300:2009+A1:2010 for further information.

3.2
Light Reflectance Value
LRV
total quantity of visible light that is reflected by a surface at all wavelengths and directions when illuminated by a light source

Note 1 to entry: The measured range of LRV is between 0 points and 100 points.

3.3
low reflective properties
characteristics that reduce reflection of light from a surface

3.4
pictogram
graphical symbol, diagram or figure with a particular meaning which directly represents or conveys its meaning independently of language through a pictorial representation of a physical object, action or character

Note 1 to entry: Refer to ISO 7001:2007, ISO/TR 7239 and ISO 9186 for rules regarding graphical symbols and frames.

3.5
slip resistant
surface finish that is sufficiently rough or otherwise specially formulated so that friction between the surface and a person's footwear or mobility aid is maintained at an acceptable level in both wet and dry conditions

Note 1 to entry: Snow and ice are outside this definition and this standard, therefore other special measures (e.g. operational) should be taken for steps and platforms etc that are exposed to these weather conditions.

3.6
spoken information
information audibly communicated in words

Note 1 to entry: This can be direct, pre-recorded or synthesized information.

3.7
station
any form of infrastructure where a train operates and passengers can board or alight in normal operation

3.8
station building
any building or structure within the confines of the station in areas for use by passengers which can be open at different times to the overall station

Note 1 to entry: This does not include other commercial structures that are not essential for travel.

3.9
tactile
information that is understood through the physical sense of touch

Note 1 to entry: Tactile signs, controls, symbols, pictograms, guide path and braille or raised characters are a physical means by which tactile information is provided.

3.10
transparent obstacle
obstacle that allows objects or images to be seen as if there were no intervening material, seen through with a level of clarity

Note 1 to entry: Transparency in this standard is when an obstacle allows at least 50 % direct light transmission.

3.11
visual acuity
clearness or acuteness of vision

3.12
visual information
written information, pictograms and markings

3.13
written information
information visually communicated in words, letters and numerals, excluding pictograms and markings

4 Symbols and abbreviations

Table 1 — Abbreviations

Abbreviation	Designation
CIE	International Commission on Illumination
EN	European Standard (Euronorm)
ISO	International Organization for Standardization
TSI	Technical Specification for Interoperability

Table 2 — Symbols

Symbol	Designation	Unit
Hz	unit of frequency	Hertz
K	unit of temperature	Kelvin
LRV	Light Reflectance Value	point
lx	unit of illuminance	lux
m	unit of length	metre
mm	unit of length	millimetre
s	unit of time	second

5 Requirements and assessment

5.1 General

Assessment of the requirements identified in Clause 5 shall be according to Annex A and Annex B. Where additional assessment criteria apply, these will be identified against the relevant clause.

All dimensions in the figures are in millimetres (mm) unless otherwise stated.

5.2 Infrastructure

5.2.1 Obstacle free route

Obstacle free route floor surfaces and ground surfaces shall have low reflective properties.

— The assessment shall be in accordance with EN ISO 2813 for paints and varnishes, an achieved gloss level of 50 or lower shall be assumed to be compliant. For any other ground material and/or surface materials an assessment is not necessary.

5.2.2 Floor surfaces

All floor coverings, ground surfaces and stair tread surfaces shall be slip resistant.

— The assessment shall be according to international or national standards.

5.2.3 Transparent obstacles

Transparent obstacles on or along the main routes used by passengers, consisting of glass doors or transparent walls, shall be marked. These markings shall highlight the transparent obstacles.

— Assessment of transparency shall be carried out with a Glass transparency meter, if transparency is greater than 50 % then the obstacle shall be marked.

— Assessment of the markings shall be according to EN 16584-1.

These markings are not required along transparent walls if passengers are protected from impact by other means — for example, by handrails or continuous benches.

Glass or other transparent/translucent materials that are coated or treated to reduce the light transmission shall have low reflective properties so as not to create a mirror effect (lighting is assumed to be the normal operating condition).

5.2.4 Lighting

1) The illuminance level of the external areas of the station shall be sufficient to facilitate way finding and to highlight the changes of level, doors and entrances.

   — Light levels shall be according to either ISO 21542 or the EN 12464 series and method of assessment according to the EN 12464 series.

2) The illuminance level along obstacle free routes shall be adapted to the visual task of the passenger. Particular attention shall be paid to the changes of levels, ticket vending offices and machines, information desks and information displays.

   i. From the accessible building entrance to the platform access point, the obstacle free route shall be illuminated, measured at floor level, within the confines of the station building.

      — Light levels shall be according to either ISO 21542 or the EN 12464 series and method of assessment according to the EN 12464 series.

   ii. The minimum lighting level shall be across the full width of the obstacle free route.

      — The obstacle free route shall be according to prEN 16587:2013.

      — The measurement shall be taken at floor level.

   iii. The minimum required light level on stairs and at the start and end of ramps, shall be measured at floor level.

      — Light levels shall be according to either ISO 21542 or the EN 12464 series and method of assessment according to the EN 12464 series.

3) The platforms shall have a minimum average illumination level measured at floor level.

— Light levels shall be according to either ISO 21542 or the EN 12464 series and method of assessment according to the EN 12464 series.

Lighting should not produce glare or reflectance, see ISO 21542 and methodology defined by CIE.

4) Emergency lighting shall provide sufficient visibility for evacuation and for identification of fire-fighting and safety equipment

— Assessment shall be according to ISO 21542 and/or EN 1838.

While the advantages of higher colour temperature in aiding visual acuity and alertness are known and beneficial for partially sighted and elderly passengers, there is also general concern over the prolonged effect of exposure to blue light. Certain technologies, for example Light Emitting Diode (LED) have raised further concerns with the effect of what is termed 'blue light hazard'. When designing any lighting installation, consideration should be given to the proximity to the light emitter, the directness of the light source, use of diffusers etc. in combination with the above information.

5.2.5 Visual information: signposting, pictograms, dynamic information

Visual information shall be easily readable in all lighting conditions when the station is operational.

— Lighting conditions shall be according to 5.2.4 of this standard.

— Visual information readability shall be assessed according to EN 16584-1 and EN 16584-2.

5.2.6 Platform danger area and edge of platform

1) The danger area of a platform commences at the rail side edge of the platform and is defined as the area where passengers are not allowed to stand when trains are passing or arriving.

— For the conventional rail system, this danger area shall be according to national rules.

2) The boundary of the danger area, furthest from the rail side edge of the platform, shall have visual marking and tactile walking surface indicators.

— The tactile walking surface indicators shall be according to EN 16584-2.

3) The visual marking shall be a contrasting, slip resistant, warning line with a minimum width of 100 mm:

— The contrast shall be assessed according to EN 16584-1;

— the slip resistance shall be assessed according to international or national standards;

— the width shall be measured horizontally and perpendicular to the track.

4) The material at the rail side edge of the platform shall be slip resistant.

— The slip resistance shall be assessed for the walking surface according to international or national standards.

5.2.7 Level track crossings

If level track crossings are used as part of obstacle free routes, or are the unique solution for all passengers, they shall have:

1) a visual warning line at the beginning and the end of the crossing surface that shall be:

   i. colour contrasting:

      — The assessment shall be according to EN 16584-1;

   ii. slip resistant:

      — The assessment shall be according to international or national standards;

   iii. a minimum width of 100 mm;

2) a ground surface that is slip resistant (this excludes the rail head):

   — the assessment shall be according to international or national standards.

5.3 Rolling stock

5.3.1 Interior doors

If more than 75 % of a door's surface is made of a transparent material, it shall be clearly marked with visual indicators:

— the assessment of transparency shall be carried out with a glass transparency meter, if transparency is greater than 50 % then the door surface shall be marked;

— the assessment of the visual indicators shall be according to EN 16584-1.

Glass or other transparent/translucent materials that are coated or treated to reduce the light transmission shall have low reflective properties so as not to create a mirror effect (lighting is assumed to be the normal operating condition).

5.3.2 Lighting

Minimum values of average illuminance in the passenger areas shall be according to EN 13272:2012, 4.1.2. Requirements relative to the uniformity of these values are not applicable for conformity with this standard.

5.3.3 Access/egress steps

All steps for access and egress shall be slip resistant.

— The slip-resistance shall be assessed for the walking surface of the step according to Clause 6 of this standard.

5.4 Boarding aids (ramps, lifts, movable steps and bridging plates) for infrastructure and rolling stock

The surface of boarding aids shall be slip resistant.

— Slip-resistance shall be assessed for the walking surface of the boarding aid according to Clause 6 of this standard.

6 Assessment methodologies

6.1 Slip resistance test

6.1.1 Principle

This test method is to determine the slip resistance of the surface of entrance steps, separate, attachable or integral, ramps and lifts. The slip resistance test methodology described below is a specific test for entrance steps, ramps and lifts and is an extract from EN 1645-1 / EN 1646-1.

6.1.2 Preparation and procedure

a) Place the step, ramp or lift surface (separate, attachable or integral) in a horizontal position ± 2° (3,5 %) (See Figure 1);

b) carry out the test at an ambient temperature of 15 °C ± 10 °C;

c) roughen the surface of the rubber sole of the friction test piece once before each test by placing it on a sheet of grade 60 to 63 emery paper and pull it, at a constant rate of (150 ± 10) mm/s, a distance of 300 mm across the surface of the emery paper;

d) spray evenly the top surface of the tread to be tested with a minimum of 1 litre of drinking water immediately prior to carrying out procedures e) and f);

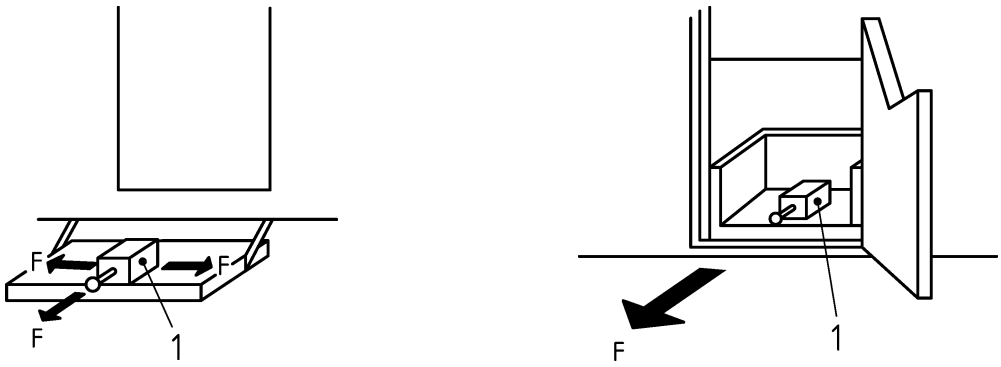
e) place the friction test piece (see Figure 2) upon the step;

f) apply a horizontal force of 150 N for approximately 10 s, using a load cell, to the friction test piece during which there shall be no visually discernible movement of the friction test piece;

g) for devices external to the vehicle the test shall be carried out in three directions as shown in Figure 1a);

h) for internal step, ramp or lift surface(s) for access/egress to the vehicle tests shall be carried out in the direction as shown in Figure 1b);

i) the above procedures d), e), f), g) and h) shall be carried out as many times as necessary to test the complete surface of the device(s) or the tread(s) of the step(s).



a) friction test piece shown on any step or device external to the vehicle

b) friction test piece shown on internal step for access or egress to the vehicle

Key

1 Friction test piece (see Figure 2)

F horizontal force of 150 N

Figure 1 — Slip resistance test

6.1.3 Expression of results

The vehicle shall be considered to have passed the test and for its step, ramp or lift surface(s) to be suitably slip resistant in accordance with the requirements if during the test as described in 6.1.2 there was no visually discernible movement of the friction test piece.

6.1.4 Test Report

A test report shall be prepared stating whether the device passed or failed the test.

The report shall state the following, if applicable:

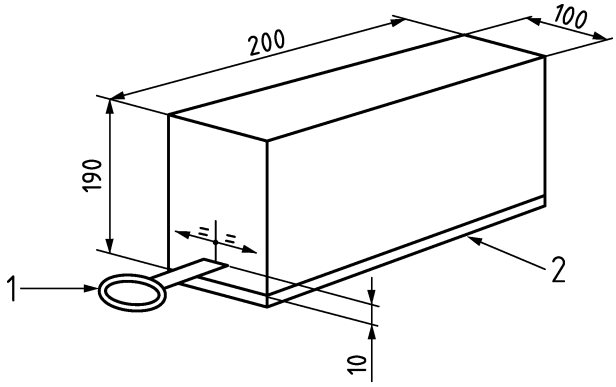
a) the approximate degree of movement of the friction test piece on the step, ramp or lift surface;

b) the position of the friction test piece on the step, ramp or lift surface(s) when movement was discerned.

6.1.5 Friction test piece

The friction test piece comprises a 30 kg steel block, 200 mm long, 100 mm wide approximately 190 mm deep (depending on the density of the steel) with an 8 mm thick rubber sole bonded to its base. The rubber sole shall be as specified in ISO 4649. A typical friction test piece is shown in Figure 2.

Dimensions in millimetres



Key

1 pulling hook securely attached

2 8 mm rubber sole

Figure 2 — Typical friction test piece

Annex A
(normative)

EC verification

A.1 Interoperability constituents

A.1.1 Conformity assessment

An EC declaration of conformity or suitability for use shall be drawn up by the manufacturer or his authorized representative established in the Union before placing an 'interoperability constituent' on the market.

The conformity assessment of an interoperability constituent shall be according to the prescribed module(s) of that particular constituent specified in A.1.2 of this standard.

A.1.2 Application of modules

The modules for the EC certification of conformity of interoperability constituents are listed in Table A.1:

Table A.1 — Modules for EC certification of conformity of interoperability constituents

Module CA	Internal production control
Module CA1	Internal production control plus product verification by individual examination
Module CA2	Internal production control plus product verification at random intervals
Module CB	EC-Type examination
Module CC	Conformity to type based on internal production control
Module CD	Conformity to type based on quality management system of the production process
Module CF	Conformity to type based on product verification
Module CH	Conformity based on full quality management system
Module CH1	Conformity based on full quality management system plus design examination
Module CV	Type validation by in service experience (Suitability for use)

The manufacturer or his authorized representative established within the Union shall choose one of the modules or module combinations indicated in Table A.2 for the constituent to be assessed:

Table A.2 — Combination of modules for EC certification of conformity of interoperability constituents

Clause	Constituents to be assessed	Module CA	Module CA1 or CA2[a]	Module CB +CC	Module CB +CD	Module CB +CF	Module CH[a]	Module CH1
5.3	Boarding aids (ramps, lifts and bridging plates)		X		X	X	X	X

[a] Modules CA1, CA2 or CH may be used only in the case of products manufactured according to a design developed and already used to place products on the market before the application of relevant TSIs applicable to those products, provided that the manufacturer demonstrates to the notified body that design review and type examination were performed for previous applications under comparable conditions, and are in conformity with the requirements of the relevant TSI; this demonstration shall be documented, and is considered as providing the same level of proof as module CB or design examination according to module CH1.

A.2 Subsystems

A.2.1 EC verification (general)

The EC verification procedure shall be performed according to the prescribed modules(s) specified in point A.2.2 of this standard.

For the infrastructure subsystem, if the applicant demonstrates that tests or assessments of a subsystem or parts of a subsystem are the same or have been successful for previous applications of a design, the notified body shall consider the results of these tests and assessments for the EC verification.

The approval process and the contents of the assessment shall be defined between the applicant and a notified body according to the requirements defined in the relevant TSI and in conformance with the rules set out in section 7 of this TSI.

A.2.2 Procedures for EC verification of a subsystem (modules)

The modules for the EC verification of subsystems are listed in the Table A.3:

Table A.3 — Modules for the EC verification of subsystems

Module SB	EC-type examination
Module SD	EC verification based on quality management system of the production process
Module SF	EC verification based on product verification
Module SG	EC verification based on unit verification
Module SH1	EC verification based on full quality management system plus design examination

The applicant shall choose one of the modules or module combinations indicated in Table A.4.

Table A.4 — Combination of modules for the EC verification of subsystems

Subsystem to be assessed	**Module SB+SD**	**Module SB+SF**	**Module SG**	**Module SH1**
Rolling stock subsystem	X	X		X
Infrastructure subsystem			X	X

The characteristics of the subsystem to be assessed during the relevant phases are indicated in Annex B, Table B.1 for infrastructure subsystem and Table B.3 for rolling stock subsystem. The applicant shall confirm that each subsystem produced complies with the type.

Annex B
(normative)

Summary of testing requirements

The sub-system characteristics that shall be assessed in the different phases of design, development and production are marked by 'X' in Table B.1 for infrastructure subsystem.

Table B.1 — Test plan for infrastructure requirements

Assessment of the infrastructure subsystem (constructed and supplied as single entity)		
Feature to be tested (all sub-clauses included)	**Design and development phase**	**Construction phase**
	Design review and/or design examination	**Site inspection**
5.2.1 Obstacle free route	X	(X) [a]
5.2.2 Floor surfaces	X	(X) [a]
5.2.3 Transparent obstacles	X	(X) [a]
5.2.4 Lighting	X	X
5.2.5 Visual information: signposting, pictograms, dynamic information	X	(X) [a]
5.2.6 Platform danger area and edge of platform	X	(X) [a]
5.2.7 Level track crossings	X	(X) [a]
5.4 Boarding aids (ramps, lifts and bridging plates)	X	(X) [a]
[a] As-built drawings shall be provided or a site inspection shall be carried out when the realization differs from the design rules or drawings that were examined.		

The subsystem characteristics that shall be assessed in the different phases of design, development and production are marked by X in Table B.2 for interoperable constituents.

Table B.2 — Test plan for interoperable constituents

Interoperability constituents and characteristics to be assessed	Assessment in the following phase			
	Design and development phase			Production phase
	Design review and/or design examination	Review of manufacturing process	Type test	Verification of conformity to type
5.4 Platform ramps	X		X	X
5.4 Platform lifts	X		X	X
5.4 Movable step and bridging plate	X		X	X
5.4 On-board ramp	X		X	X
5.4 On-board lift	X		X	X

The sub-system characteristics that shall be assessed in the different phases of design, development and production are marked by X in Table B.3 for rolling stock subsystem.

Table B.3 — Test plan for rolling stock requirements

Characteristics to be assessed	Design and development phase		Production phase
	Design review and/or design examination	Type test	Routine test
5.3.1 Interior doors	X	X	
5.3.2 Lighting		X	
5.3.3 Access/egress steps	X		
5.4 Boarding aids (ramps, lifts, movable steps and bridging plates)	X	X	X

Annex C
(informative)

Colour temperature for lighting

Table C.1 indicates colour temperatures for typical light sources.

Table C.1 — Indicative colour temperatures for lighting

Temperature K	**Source**
1 700	match flame and oil lamps
1 850	candle flame
2 300	early morning sunrise
2 700 to 3 300	incandescent light bulb
3 400	studio lamps, photofloods, etc.
3 800	fluorescent lights
4 100	moonlight
5 000	warm / horizon daylight
5 500 - 6 000	cool daylight (12h00 midday), electric flash
6 420	xenon arc lamp
6 500	daylight, overcast
9 300	TV (analogue) screen

NOTE These temperatures are characteristic examples; considerable variation can be present.

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC aimed to be covered

This European Standard has been prepared under a Commission's standardization request M/483 to provide one voluntary means of conforming to the Essential Requirements of the Directive 2008/57/EC on the interoperability of the rail system (recast) and with the associated TSIs.

Once this standard is cited in the Official Journal of the European Union under that Directive 2008/57/EC, compliance with the normative clauses of this standard given in Table ZA.1 for PRM TSI confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations and with the TSI requirements.

Table ZA.1 — Correspondence between this European Standard, the Commission Regulation (EU) No 1300/2014 of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility and repealing Decision 2008/164/EC (published in the Official Journal L 356, 12.12.2014, p.110) and Directive 2008/57/EC

Clause/subclauses of this European Standard	Chapter/§/annexes of the Technical Specification for Interoperability (TSI)	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
Clauses 3, 4, 5, 6 Annexes A, B	4. Characterisation of the subsystems 4.2. Functional and technical specifications 4.2.1. Infrastructure Subsystem 4.2.2. Rolling Stock Subsystem 5. Interoperability constituents 5.3 List and characteristics of constituents 5.3.1 Infrastructure 5.3.2 Rolling stock 6. Assessment of conformity and/or suitability for use 6.1 Interoperability constituents 6.2. Subsystems Appendix D: Assessment of interoperability constituents Appendix E: Assessment of the subsystems Appendix N: PRM Signage	Annex III, Essential Requirements 1 General requirements 1.1 Safety Clauses 1.1.1, 1.1.5 1.2 Reliability and availability 1.3 Health 1.6 Accessibility Clause 1.6.1 2 Requirements specific to each subsystem 2.1 Infrastructure Clauses 2.1.1, 2.1.2 2.4 Rolling stock Clauses 2.4.1§4, 5, 6, 7, 8, 9, 10, 2.4.2, 2.4.3, 2.4.5	The Essential Requirements incorporate those relating to Accessibility added to Directive 2008/57/EC by Commission Directive 2013/9/EU.

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the products falling within the scope of this standard.

Bibliography

[1] BS 8300:2009+A1 2010, *Design of buildings and their approaches to meet the needs of disabled people. Code of practice*

[2] EN 1645-1, *Leisure accommodation vehicles — Caravans — Part 1: Habitation requirements relating to health and safety*

[3] EN 1646-1, *Leisure accommodation vehicles — Motor caravans — Part 1: Habitation requirements relating to health and safety*

[4] EN 16585-1, *Railway applications — Design for PRM use — Equipment and components on board rolling stock — Part 1: Toilets*

[5] EN 16585-2, *Railway applications — Design for PRM use — Equipment and components on board rolling stock — Part 2: Elements for sitting, standing and moving*

[6] EN 16585-3, *Railway applications — Design for PRM use — Equipment and components on board rolling stock — Part 3: Passageways and internal doors*

[7] prEN 16586-1:2013, *Railway applications — Design for PRM use — Accessibility of persons with reduced mobility to rolling stock — Part 1: Steps for egress and access*

[8] prEN 16586-2:2013, *Railway applications — Design for PRM use — Accessibility of persons with reduced mobility to rolling stock — Part 2: Boarding aids*

[9] Commission Regulation (EU) No 1300/2014 of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility; OJEU L 356, 12.12.2014

[10] ISO 7001:2007, *Graphical symbols — Public information symbols*

[11] ISO/TR 7239, *Development and principles for application of public information symbols*

[12] ISO 9186-1, *Graphical symbols — Test methods — Part 1: Method for testing comprehensibility*

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