



SLOVENSKI STANDARD
kSIST-TP FprCEN/TR 17621:2021
01-april-2021

Dostopnost in uporabnost grajenega okolja - Merila in specifikacije glede tehnične učinkovitosti

Accessibility and usability of the built environment - Technical performance criteria and specifications

Barrierefreiheit und Nutzbarkeit der gebauten Umgebung - Technische Leistungskriterien und Anforderungen

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: FprCEN/TR 17621
<http://standards.iteh.ai/catalog/standards/sist/17621-2021/f385bc3a7dab/ksist-tp-fprcen-tr-17621-2021>

ICS:

91.010.30	Tehnični vidiki	Technical aspects
91.040.01	Stavbe na splošno	Buildings in general

kSIST-TP FprCEN/TR 17621:2021 **en,fr,de**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[kSIST-TP FprCEN/TR 17621:2021](https://standards.iteh.ai/catalog/standards/sist/ae0107f5-a43c-43ac-96a8-f385bc3a7dab/ksist-tp-fprcen-tr-17621-2021)

<https://standards.iteh.ai/catalog/standards/sist/ae0107f5-a43c-43ac-96a8-f385bc3a7dab/ksist-tp-fprcen-tr-17621-2021>

TECHNICAL REPORT
RAPPORT TECHNIQUE
TECHNISCHER BERICHT

FINAL DRAFT
FprCEN/TR 17621

January 2021

ICS

English version

Accessibility and usability of the built environment - Technical performance criteria and specifications

Barrierefreiheit und Nutzbarkeit der gebauten
Umgebung - Technische Leistungskriterien und
Anforderungen

This draft Technical Report is submitted to CEN members for Vote. It has been drawn up by the Technical Committee CEN/CLC/JTC 11.

CEN and CENELEC members are the national standards bodies and national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a Technical Report. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a Technical Report.



CEN-CENELEC Management Centre:
Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword	5
Introduction	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions	7
4 Legal and policy background and associated benefits	8
5 Diversity of users and design considerations.....	8
6 Wayfinding	8
6.1 Wayfinding, orientation and navigation.....	8
6.2 Wayfinding information	8
6.3 Visual contrast	9
6.4 Tactile information	14
6.5 Audible information and hearing enhancement	19
6.6 Signage.....	20
6.7 Graphical symbols	25
7 Access in the outdoor environment	26
7.1 Accessible routes.....	26
7.2 Street furniture.....	36
7.3 Pedestrian crossings.....	38
7.4 Squares and plazas.....	44
7.5 'Shared Space' design approach.....	45
7.6 Plantings.....	46
7.7 Pedestrian bridges and underpasses.....	47
8 Arrival and departure areas – Parking areas	48
8.1 Rationale	48
8.2 Boarding points/Set-down points	48
8.3 Location of designated accessible parking spaces.....	49
8.4 Number of designated accessible parking spaces.....	49
8.5 Design of designated accessible parking space	50
8.6 Pedestrian paths in car parks.....	51
8.7 Signage of designated parking spaces.....	51
8.8 Access from parking space to an adjacent higher pedestrian path	52
8.9 Surface	52
8.10 Indoor parking.....	52
8.11 Cycle parking	52
9 Horizontal circulation in buildings	52
9.1 Entrances	52
9.2 Corridors and passageways	58
9.3 Doors	61
9.4 Windows.....	66
9.5 Patios, balconies, terraces	68
9.6 Surface finishes and materials	69
10 Vertical circulation in buildings and outdoors	71
10.1 Ramps.....	71
10.2 Steps and stairs.....	78

10.3	Handrails	83
10.4	Lifts	87
10.5	Vertical and inclined lifting platforms	98
10.6	Escalators and moving walks	103
11	Specific indoor and outdoor areas, equipment and provisions	103
11.1	Service counters for information, ticketing and reception	103
11.2	Waiting and queuing areas	105
11.3	Seating and resting areas	106
11.4	Storage areas, lockers and baggage storage	109
11.5	Kitchen areas and kitchenettes	110
11.6	Facilities for assistance dogs (outdoor and indoor)	112
12	Sanitary accommodation	113
12.1	Accessible toilets	113
12.2	Toilets for general use	122
12.3	Sanitary facilities for other users	123
12.4	Showers and bathrooms	129
13	User interface, controls and switches	131
13.1	Rationale	131
13.2	Public ICT information screens	131
13.3	ICT user interfaces	132
13.4	Controls and switches	133
13.5	Examples of general use elements	135
14	Fire safety for all - Evacuation and emergency exits	136
14.1	Concept for Fire safety for all	136
14.2	Fire engineering design objectives	136
14.3	Evacuation for all	136
14.4	Assistive fire evacuation: Areas of rescue assistance	136
14.5	Emerging fire evacuation technologies	137
14.6	Fire defence plans	137
14.7	Lifts for emergency evacuation	137
14.8	Emergency warning systems, signals and information	137
14.9	Emergency exit doors	138
15	Environmental conditions in buildings	138
15.1	Lighting	138
15.2	Acoustics	145
15.3	Indoor air quality	151
16	Accommodation	152
16.1	General	152
16.2	Hotels	152
16.3	Student accommodation	157
16.4	Adaptable housing	157
17	Cultural, leisure and sport buildings	161
17.1	General	161
17.2	Auditoriums, concert halls and similar	161
17.3	Libraries	164
17.4	Museums	166
17.5	Heritage buildings and sites	168
17.6	Retail and shopping buildings	172
17.7	Sport facilities	174

FprCEN/TR 17621:2021 (E)

17.8	Restaurants, bars and cafés.....	175
17.9	Swimming pools, saunas	178
18	Administrative, service and employment buildings	179
18.1	General.....	179
18.2	Conference venues.....	179
18.3	Offices.....	180
18.4	Healthcare buildings.....	180
18.5	Educational buildings.....	186
18.6	Laboratories	188
18.7	Banks, post offices	189
18.8	Industrial buildings.....	190
18.9	Courts, police stations and detention facilities.....	191
18.10	Religious buildings.....	192
19	Outdoor and urban areas.....	193
19.1	General.....	193
19.2	Playgrounds.....	193
19.3	Garden, parks and nature parks.....	193
19.4	Beaches.....	194
20	Transport facilities.....	195
20.1	General.....	195
20.2	Taxi facilities	195
20.3	Bus and coach facilities.....	196
20.4	Rail facilities	201
20.5	Metro/underground facilities.....	203
20.6	Tram and light rail facilities	204
20.7	Airport facilities	205
20.8	Ports facilities	206
20.9	Cable car facilities.....	207
20.10	Service stations.....	207
	Annex A (informative) Visual contrast charts	209
	Annex B (informative) Examples of pedestrian crossings	212
	List of figures	219
	Bibliography.....	223

European foreword

This document (FprCEN/TR 17621:2021) has been prepared by the Joint Technical Committee CEN-CENELEC/JTC 11 “Accessibility in the built environment”, the secretariat of which is held by UNE.

This document is currently submitted to the Vote on TR.

This document has been prepared under Mandate M/420 given to CEN, CENELEC and ETSI by the European Commission and the European Free Trade Association in support of European accessibility requirements for public procurement in the built environment.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[kSIST-TP FprCEN/TR 17621:2021](https://standards.iteh.ai/catalog/standards/sist/ae0107f5-a43c-43ac-96a8-f385bc3a7dab/ksist-tp-fprcen-tr-17621-2021)

<https://standards.iteh.ai/catalog/standards/sist/ae0107f5-a43c-43ac-96a8-f385bc3a7dab/ksist-tp-fprcen-tr-17621-2021>

Introduction

This document exemplifies the technical performance criteria and specifications to fulfil the functional requirements given in the European Standard EN 17210. It demonstrates a proposal, or proposals, to achieve the EN requirements and recommendations, drawing on performance criteria and specifications given in International Standard ISO 21542, where these exist and/or with examples from other standards and guidance documents, where relevant.

Alternatively, national standards or regulations may be used to determine the technical performance criteria and specifications to fulfil the functional requirements of the EN 17210.

Another CEN-CENELEC Technical Report (FprCEN/TR 17622) will detail the assessment of conformity to the functional requirements given in the European Standard EN 17210.

This document is intended to be read alongside EN 17210. The structure in FprCEN/TR 17621 follows the EN structure, listing the equivalent headings, clauses and bullet points (a), b), c) etc.) and providing a way, or ways, to achieve the functional requirements and recommendations.

Where there are no technical criteria related to the EN clause / sub-clause, such as the Rationale, this is stated rather than leaving this blank.

Technical performance criteria and specifications from ISO 21542:2011 are used in the FprCEN/TR 17621 as the main source of information, and this is not referenced as the source each time, as this would be repetitive. When the source is ISO/DIS 21542:2020 (Enquiry version) we include this source in brackets, and other sources are also referenced.

Other sources are used where these have been identified as providing information not covered in ISO 21542 or useful supplementary information.

Additional sources include:

- 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*.
- EN 16584-3, *Railway applications – Design for PRM use – General requirements – Part 3: Optical and friction characters*.
- EN 16587, *Railway applications – Design for PRM use – Requirements for obstacle free routes for infrastructure*,
- Other specific ENs and product related ENs,
- National standards,
- Guidance on a specific matter.

See also Bibliography.

1 Scope

This document has been developed to support EN 17210, "Accessibility and usability of the built environment – Functional requirements". This document provides and exemplifies technical performance criteria and specifications for an accessible and usable built environment, following the Design for All/Universal design principles. The document specifies what is necessary to align with these principles which will facilitate equitable and safe use for a wide range of users.

The technical performance criteria and specifications are applicable across the full spectrum of the built environment and can be used as criteria for awarding public contracts (in support of the Public Procurement Directives).

These technical performance criteria and specifications are specifically applicable to the design, construction, refurbishment or adaptation, and maintenance of public or public-use environments including external areas.

Alternatively, national standards and regulations may determine the technical performance criteria and specifications to fulfil the functional requirements of the EN 17210.

NOTE 1 Design for All and Universal Design share a similar inclusive design philosophy. Universal Design means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. Universal Design shall not exclude assistive devices for particular groups of persons with disabilities where this is needed (UN CRPD).

NOTE 2 Terms such as "design for all", "universal design", "accessible design", "barrier-free design", "inclusive design" and "transgenerational design" are often used interchangeably with the same meaning.

2 Normative references (standards.iteh.ai)

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.

EN 17210, *Accessibility and usability of the built environment - Functional requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 17210 and the following apply:

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

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

3.1

light reflectance value

LRV

proportion of visible light reflected by a surface at all wavelengths and directions when illuminated by a light source

Note 1 to entry: *LRV* is also known as the luminance reflectance factor or CIE Y value (see International Commission on Illumination, CIE, Publication 15:2004, 3rd Edition, *Colorimetry*).

Note 2 to entry: The *LRV* is expressed on a scale of 0 to 100, with a value of 0 points for pure black and a value of 100 points for pure white.

[SOURCE: ISO 21542:2011, definition 3.41]

FprCEN/TR 17621:2021 (E)**3.2****luminance contrast**

luminance of one surface or component compared to the luminance of the background or adjoining surface

[SOURCE: ISO/DIS 21542:2020, 3.28, modified]

4 Legal and policy background and associated benefits

See EN 17210, no applicable technical specification.

5 Diversity of users and design considerations

See EN 17210, no applicable technical specification.

6 Wayfinding**6.1 Wayfinding, orientation and navigation****6.1.1 Rationale**

See EN 17210, no applicable technical specification.

The functional requirements and recommendations in EN 17210 can be achieved by providing:
iTeh STANDARD PREVIEW
(standards.iteh.ai)

6.1.2 General

This is an overview of 6.2 to 6.8.

<https://standards.iteh.ai/catalog/standards/sist/ae0107f5-a43c-43ac-96a8-f385bc3a7dab/ksist-tp-fprcen-tr-17621-2021>

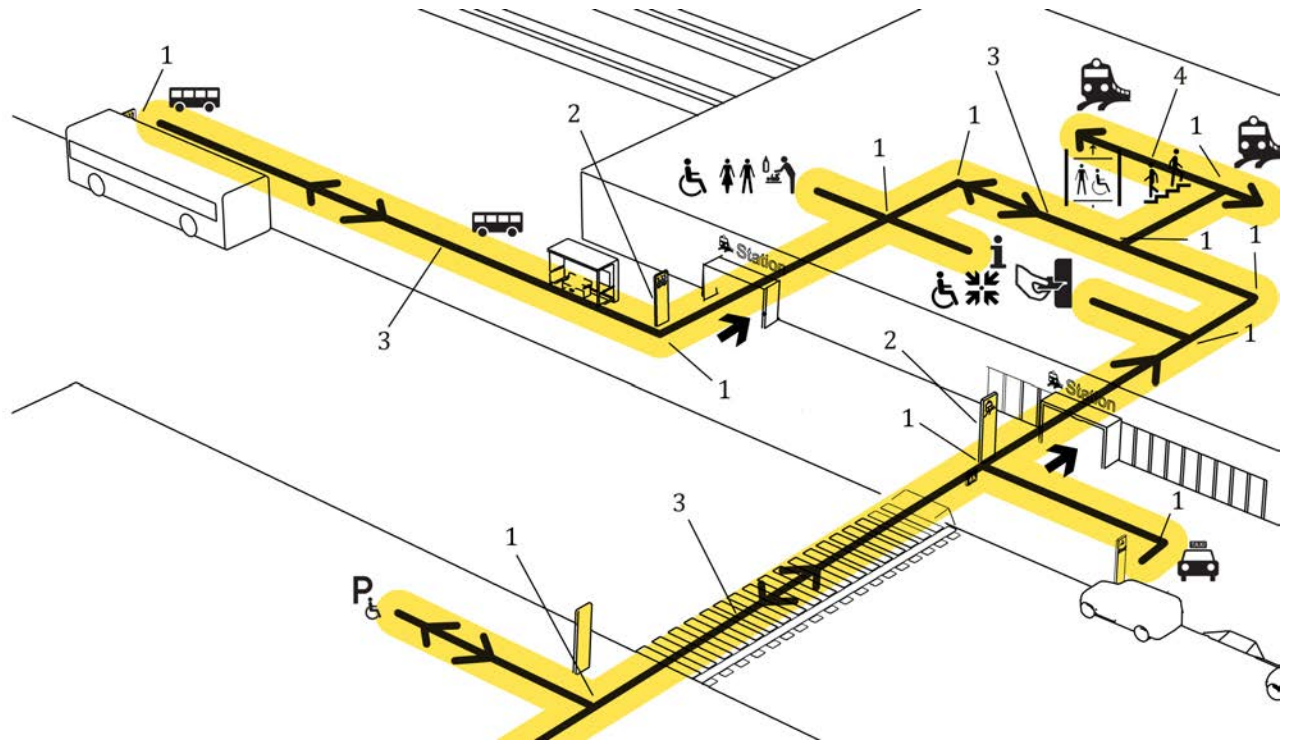
6.2 Wayfinding information**6.2.1 Rationale**

See EN 17210, no applicable technical specification.

The functional requirements and recommendations in EN 17210 can be achieved by providing:

6.2.2 General

- a) Information that is regularly monitored for accuracy and checked with users of the environment for usefulness. See also Figure 1.
- b) Priority of safety information, followed by information for wayfinding, then general and instructional information, though, for instance, relative size and positioning of visual information, and ordering of audible information with safety first etc. These are to stand out from advertising information.
- c) Only one key message for each announcement or sign, using short sentences or phrases.
- d) Consistent information along a route including at decision points, for instance using the same term for 'Meeting room 1' along a route and at the destination, not changing to Training Room on arrival.
- e) Short words avoiding abbreviations; with a clear meaning checked to ensure understood by users.
- f) The same information through a range of formats such as audible, visual, tactile.
- g) See 6.7 Graphical symbols.



Key

- 1 decision points with consistent information, minimum for every 50 m (EN 16587-2)
- 2 limited number of pictograms in signage on a single location (EN 16587-2)
- 3 tactile and visually contrasting routes (EN 16587-2)
- 4 audible information with requirements to speech intelligibility (EN 16587-2)

Figure 1 — Examples of wayfinding features on accessible routes in railway infrastructure

6.3 Visual contrast

6.3.1 Rationale

See EN 17210, no applicable technical specification.

The functional requirements and recommendations in EN 17210 can be achieved by providing:

6.3.2 General

Visual contrast according to the area and visual task in a) to c). Visual contrast is specified and measured in various ways in different European countries.

- a) For large area surfaces (i.e. walls, floors, doors, ceiling) and to facilitate orientation and guiding (i.e. handrails, door furniture, and visual indicators on glazed areas) a visual contrast value of:
 - Using Michelson method, a luminance contrast $C_M \geq 30\%$ between the two surfaces, with LRV of the lighter surface ≥ 40 points; or
 - Using the Weber method, a luminance contrast $C_W \geq 45\%$ between the two surfaces, with LRV of the lighter surface ≥ 40 points; or
 - Using LRV difference method, a difference in $LRV \geq 30$ points between the two surfaces; with LRV of the lighter surface ≥ 40 points.

FprCEN/TR 17621:2021 (E)

- b) For potential hazards, (i.e. visual indicator on steps and glazed doors), small items (i.e. switches and controls) and self-contrasting markings a high visual contrast value of:
- Using Michelson method, a luminance contrast $C_M \geq 60\%$ between the two surfaces, with LRV of the lighter surface ≥ 50 points; or
 - Using the Weber method, a luminance contrast $C_W \geq 75\%$ between the two surfaces, with LRV of the lighter surface ≥ 50 points; or
 - Using LRV difference method, a difference in $LRV \geq 60$ points between the two surfaces or between the potential hazard and background surface.
- c) To facilitate reading of signs, information and instructions, a high contrast value of:
- Using Michelson method, a luminance contrast $C_M \geq 60\%$ between the text or symbols and the background, with LRV of the lighter surface ≥ 70 points; or
 - Using the Weber method, a luminance contrast $C_W \geq 75\%$ between the text or symbols and the background, with LRV of the lighter surface ≥ 70 points; or
 - Using LRV difference method, a difference in $LRV \geq 60$ points between the text or symbols and the background; with LRV of the lighter surface ≥ 70 points.

See Annex A for charts showing examples of the application of visual contrast using these methods.

Where reflecting materials with highly glossy or shiny surfaces are used for one or both surfaces of interest, e.g. brushed metal, a higher minimum luminance contrast value is required than for non-reflecting materials:

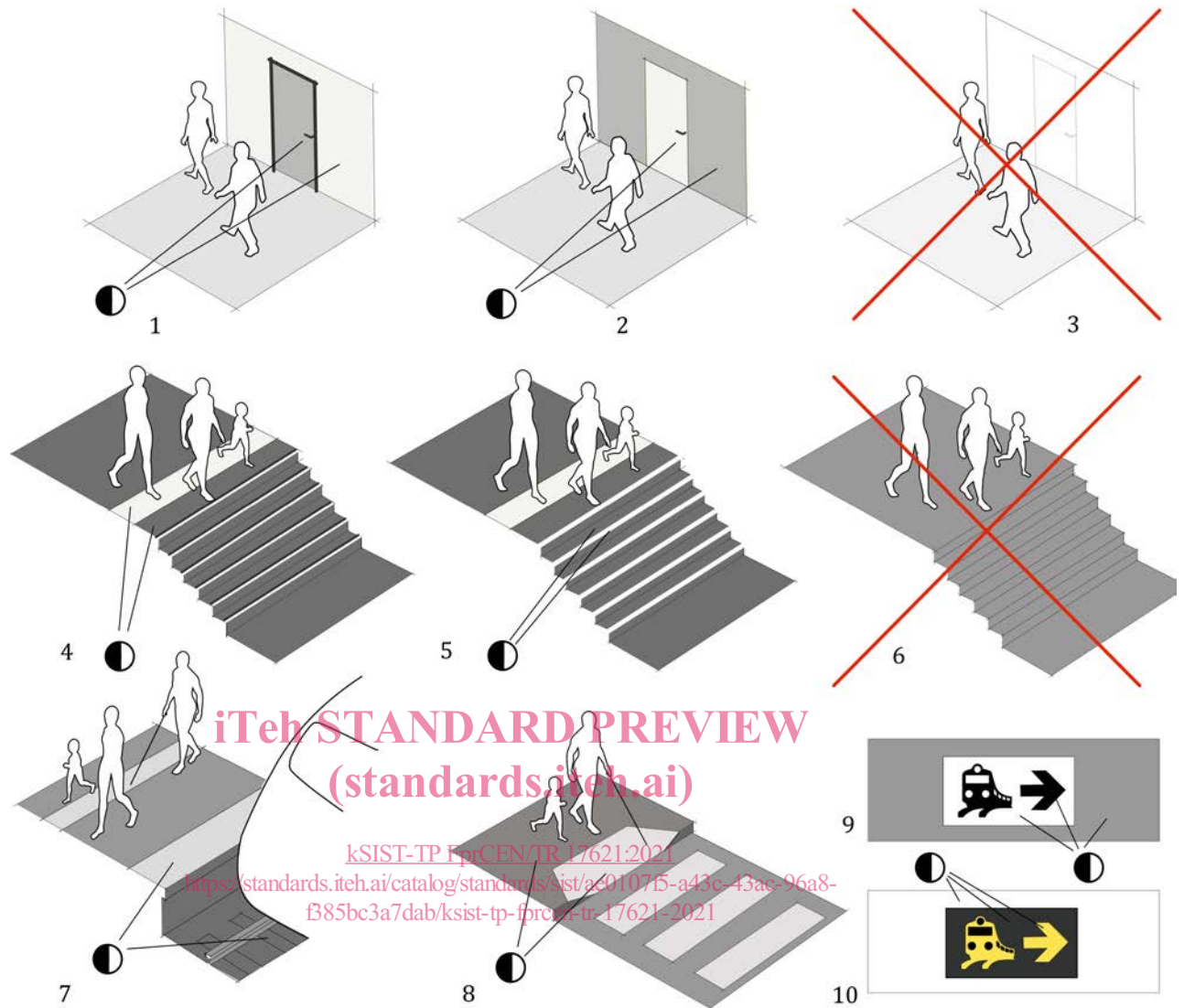
Large surface areas (i.e. walls, floors, doors, ceiling) elements and components to facilitate orientation (i.e. base plates of controls), $C_M \geq 40\%$ with a minimum LRV of the lighter surface ≥ 40 points ($C_W \geq 57\%$, LRV difference ≥ 40 points).

Small items necessary to enable use of building elements (i.e. control buttons, inscriptions on controls), $C_M \geq 70\%$ with a minimum LRV of the lighter surface ≥ 70 points, ($C_W \geq 82\%$, LRV difference ≥ 70 points).

See ISO/DIS 21542:2020, 10.3.3. For stainless steel, see also EN 16584-1.

For the application of visual contrast on elements see the specific clauses such as 6.6 Signage; 7.1 Accessible routes; 9.3 Doors and door frames; 10.2 Steps and stairs; 10.3 Handrails; 10.4 Lifts, 10.5 Vertical and inclined lifting platforms, 10.6 Escalators and moving walks and 12 Sanitary accommodations.

See also Figure 2 and Figure 3.



Key

- 1 light wall with contrast $C_M \geq 30\%$ (LRV difference ≥ 30 points) to darker door
- 2 grey wall with contrast $C_M \geq 30\%$ (LRV difference ≥ 30 points) to lighter door
- 3 not recommended: contrast C_M between wall and door less than 30%
- 4 light tactile walking surface indicator with contrast $C_M \geq 50\%$ (LRV difference ≥ 50 points) to dark first step of stairs
- 5 dark step surface with contrast $C_M \geq 60\%$ (LRV difference ≥ 60 points) to light step nosing marking
- 6 not recommended: no step surface contrast to step nosings
- 7 light attention pattern on railway platform with contrast to dark area outside platform (EN 16584-1)
- 8 light kerb ramp with contrast $C_M \geq 50\%$ (LRV difference ≥ 50 points) to footpath
- 9 dark text or pictograms with contrast $C_M \geq 60\%$ (LRV difference ≥ 60 points) to white background, signage mounted on dark wall
- 10 light text or pictograms with contrast $C_M \geq 60\%$ (LRV difference ≥ 60 points) to dark background, signage mounted on light wall

Figure 2 — Examples of use of visual contrast in built environments

See Annex A with examples of visual contrast charts.

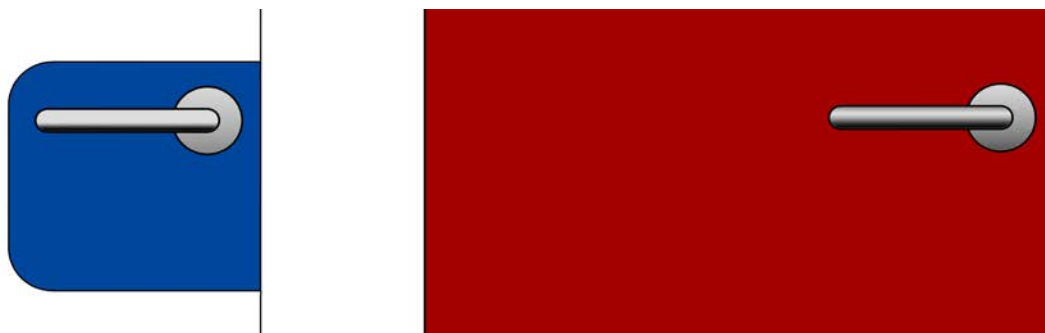


Figure 3 — Examples of visual contrast of door handles to surrounding areas (EN 16584-1)

6.3.3 Achieving and maintaining visual contrast

- Where visual contrast is likely to deteriorate through, for example, cleaning of high trafficked floor surfaces; or weathering of outdoor surfaces for example asphalt can appear lighter over time and visual contrast reduced; or where lighting levels are low or subject to variation through changes in natural or artificial lighting levels; a higher contrast value at installation allows for this. For large areas, a luminance contrast $C_M \geq 40\%$ (LRV difference ≥ 40 points) between the two surfaces, with LRV of the lighter surface ≥ 40 points; and for small items and potential hazards $C_M \geq 70\%$ (LRV difference ≥ 70 points), with LRV of the lighter surface ≥ 70 points.
- Regular checks of visual contrast levels in safety situations such as railway platforms and step nosings; to ensure high visual contrast is maintained for small items such as text, characters and symbols on signs, and for characters on small control buttons and operating mechanisms; and to ensure effective visual contrast is maintained where lighting levels are low.
- A visual contrast equivalent to less than 20 points difference on the LRV scale throughout the different colours in a patterned floor surface.

6.3.4 Lighting and wayfinding

- and b) See 15.1 Lighting.

6.3.5 Visual indicators on glazing

6.3.5.1 Rationale

See EN 17210, no applicable technical specification.

The functional requirements and recommendations in EN 17210 can be achieved by providing:

6.3.5.2 General

- Uninterrupted visual indicators of at least 75 mm height shall be placed at a height of 900 mm to 1 000 mm and 1 500 mm to 1 600 mm above floor level. An additional visual indicator placed at a height of 100 mm to 300 mm is recommended. See 9.3.11 Glazed doors and panels.

NOTE Partially sighted persons can have a limitation of visual field, which results in looking down at an angle of 45° to 50° . When they are within 1 000 mm to 1 500 mm from a fully glazed door or sidelight, they can detect the visual barrier at a height of 900 mm to 1 000 mm, provided the visual contrast criteria have been applied to the background. The background in all cases is the circulation space on the opposite side of the glass door.

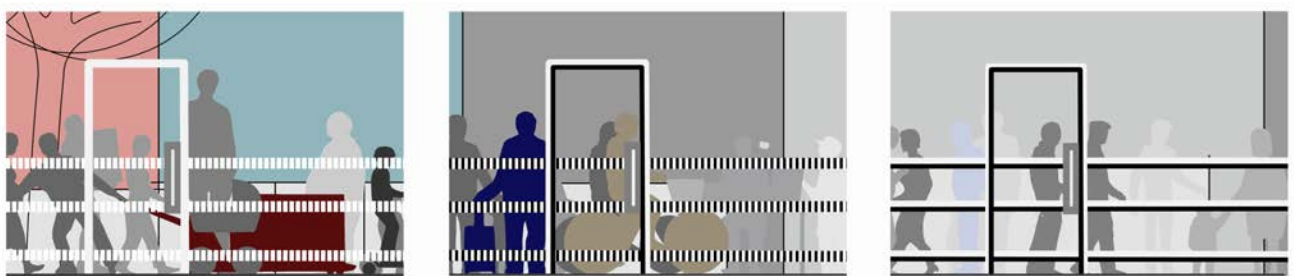
Visual indicators on general glazed areas with a difference in visual contrast $C_M \geq 30\%$ (LRV difference ≥ 30 points) to the background, with LRV of the lighter surface ≥ 40 points. Visual

indicators consisting of two separate colours, or two shades of the same colour, with a visual contrast $C_M \geq 60\%$ / $C_W \geq 75\%$, and LRV of the lighter surface ≥ 50 points (LRV difference ≥ 60 points) are preferred as they enable lighting conditions and backgrounds from either side of the glazing to be taken into account (ISO/DIS 21542: 2020, 8.1.1.4; EN 16584-1:2017, Annex B.6).

Visual indicators may also take the form of a broken line, sign, logo, or patterning on the glass with the visually contrasting indicator covering at least 75 % of the 100 mm indicator zone. For two-tone indicators each of the two colours or shades covers at least 30 % of the zone with a combined total of 75 % of the zone (EN 16584-1:2017, Annex B.6).

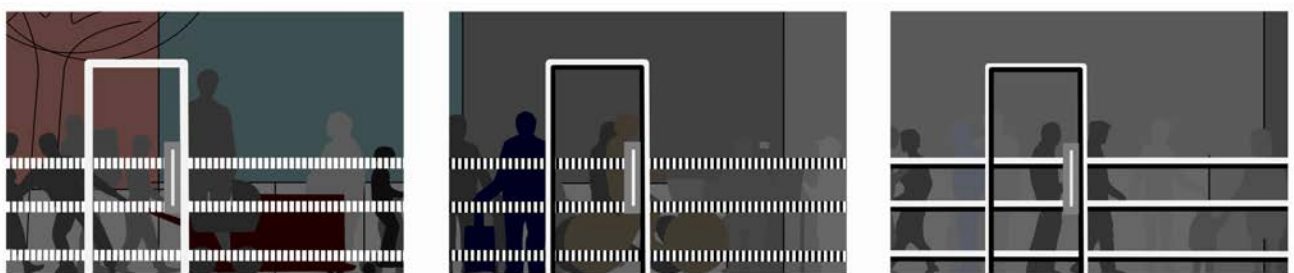
- b) A visually contrasting strip on the edge of any free-standing glazed screens with a visual contrast $C_M \geq 60\%$ / $C_W \geq 75\%$, and LRV of the lighter surface ≥ 50 points to the background (LRV difference ≥ 60 points). See 9.3.11 Glazed doors and panels.

See Figure 4, Figure 5 and Figure 6.



- a) light 75 % coverage bands on shifting background
- b) self-contrasting full coverage bands on shifting background
- c) self-contrasting full coverage bands on low contrast background

Figure 4 — Examples of visually contrasting markings on different backgrounds, daylight conditions



- a) light 75 % coverage bands on dark background
- b) self-contrasting full coverage bands on dark background
- c) self-contrasting full coverage bands on dark background

Figure 5 — Examples of visually contrasting markings on different backgrounds, low light conditions