



SLOVENSKI STANDARD
SIST EN 81-70:2021/oprA1:2021
01-september-2021

Varnostna pravila za konstruiranje in vgradnjo dvigal (liftov) - Posebne izvedbe osebnih in osebno-tovornih dvigal - 70. del: Dostopnost dvigal za osebe, vključno z invalidi

Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lift - Part 70: Accessibility to lifts for persons including persons with disability

Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen - Besondere Anwendungen für Personen- und Lastenaufzüge - Teil 70: Zugänglichkeit von Aufzügen für Personen einschließlich Personen mit Behinderungen

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Règles de sécurité pour la construction et l'installation des élévateurs - Applications particulières pour les ascenseurs et ascenseurs de charge - Partie 70 : Accessibilité aux ascenseurs pour toutes les personnes y compris les personnes avec handicap

Ta slovenski standard je istoveten z: EN 81-70:2021/prA1

ICS:

91.140.90 Dvigala. Tekoče stopnice Lifts. Escalators

SIST EN 81-70:2021/oprA1:2021 en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
EN 81-70:2021
prA1

June 2021

ICS 91.140.90

English Version

**Safety rules for the construction and installation of lifts -
Particular applications for passenger and goods passenger
lift - Part 70: Accessibility to lifts for persons including
persons with disability**

Règles de sécurité pour la construction et l'installation
des élévateurs - Applications particulières pour les
ascenseurs et ascenseurs de charge - Partie 70 :
Accessibilité aux ascenseurs pour toutes les personnes
y compris les personnes avec handicap

Sicherheitsregeln für die Konstruktion und den Einbau
von Aufzügen - Besondere Anwendungen für
Personen- und Lastenaufzüge - Teil 70: Zugänglichkeit
von Aufzügen für Personen einschließlich Personen
mit Behinderungen

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 10.

This draft amendment A1, if approved, will modify the European Standard EN 81-70:2021. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

This draft amendment was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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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.

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

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

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European foreword

This document (EN 81-70:2021/prA1:2021) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

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(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of EN 81-70:2021.

The need for an amendment was based on the following points:

- Modified requirements on luminance contrast by changing from LRV difference to Michelson contrast for symbols to their background;
- Addition of requirement for illumination of control devices;
- New Annex for guidance on measurement of luminance contrast.

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EN 81-70:2021/prA1:2021 (E)

1 Modifications to Clause 5, "Safety requirements and/or protective measures"

Replace the current subclause 5.1.2 with the following:

"5.1.2 Where luminance contrast between adjacent surfaces is required it shall comply with Table 2.

Table 2 —Requirements for luminance contrast

Clause	Item	Minimum light reflectance value point difference $LRV_1 - LRV_2$	Minimum luminance contrast C_M [%]	Minimum light reflectance value of lighter surface LRV_1	Viewing angle
Table 4, item c)	Active part of push buttons to their surrounding	30	-	-	45° above horizontal
Table 4, item d)	Face plates to their surrounding	30	-	-	Horizontal
Table 4, item j)	Symbols on push buttons to active areas	-	50	50	45° above horizontal
5.4.3.3 c)	Lift designation markings to background	-	50	50	Horizontal

NOTE 1 For determination of luminance contrast and light reflectance values, see informative Annex E. For further guidance on contrast, see ISO 21542:2021, 10.3 and Annex E.

NOTE 2 On shiny and direct reflective surfaces, unfavourable reflections can reduce luminance contrast. Light colour tones for ceiling and wall surfaces, diffuse reflective materials and a wide light distribution prevent disturbing reflections on the control devices.

NOTE 3 Updated standards for the built environment (e.g. ISO 21542:2021) recommend considering minimum luminance contrast using Michelson formula instead of LRV difference also for larger areas."

In 5.3.2, add the following new subclause 5.3.2.5:

"5.3.2.5 Lighting shall provide a minimum illuminance of 100 lx in the plane of the item which can be vertical or tilted."

2 Addition of Annex E (informative), "Determination of luminance contrast and light reflectance values"

Add a new informative Annex E as follows:

"

Annex E (informative)

Determination of luminance contrast and light reflectance values

E.1 Relevant values for determination

Michelson contrast is determined according to the following formula:

$$C_M = \frac{L_1 - L_2}{L_1 + L_2} \times 100 \%$$

where

L_1 is the luminance of the lighter surface in cd/m^2 , and

L_2 is the luminance of the darker surface in cd/m^2 .

For materials with a diffuse reflection (e.g. matt materials), the luminance can also be replaced by the light reflectance values in the following formula:

$$C_M = \frac{LRV_1 - LRV_2}{LRV_1 + LRV_2} \times 100 \%$$

where

LRV_1 is the light reflectance value or CIE Y-value of the lighter surface, and

LRV_2 is the light reflectance value or CIE Y-value of the darker surface.

For definition of CIE Y-value, see EN ISO/CIE 11664-3:2019.

Where the LRV of the lighter surface is not provided, it can be determined by comparison with a sample of known LRV while measuring the luminance according to E.2.1. For comparison, the following formula applies:

$$LRV_1 = LRV_s \times \frac{L_1}{L_s}$$

where

LRV_1 is the light reflectance value of the lighter surface,

LRV_s is the light reflectance value of the standard LRV sample,

L_1 is the luminance of the lighter surface, and

L_s is the luminance of the sample.

EN 81-70:2021/prA1:2021 (E)

E.2 Measurement methods and means for determination of luminance contrast

E.2.1 Measurement means

Luminance contrast and LRV values can be determined by the following means. To determine which instrument is more appropriate, the following information should be taken into consideration:

- Luminance meter camera provides all relevant measures within one process step and is applicable independent of the size of the details. The relevant areas to be considered for determination of luminance contrast are defined on the photo during the analysis. This procedure also provides a good documentation of the measurement.
- Luminance meter can also be used for measurement of the luminance of the relevant areas. However, depending on the specific measuring angle of the luminance meter, it requires a high degree of accuracy in the alignment of the instrument for small details as to be considered on lift buttons and would need to be applied with short distance which could create shadow.
- LRV values (CIE Y-values) for colours which are provided by different colour systems (RAL, NCS...). This method should only be used for matt surfaces for which the LRV does not depend on reflections.
- Contact type instruments measuring the light reflectance. This method can only be used for larger areas and for matt materials for which the LRV does not depend on reflections.

It is also possible to establish an approximate light reflectance value by making a black and white photo of the surface of interest together with colour swatches, panels of colour samples, or grey scales under the viewing angle specified in Table 2 and compare the brightness of these surfaces. Alternatively, by placing a LRV scale against the surface of interest, a reasonable match can be identified. LRV values approximated in this way will also be dependent upon ambient lighting levels.

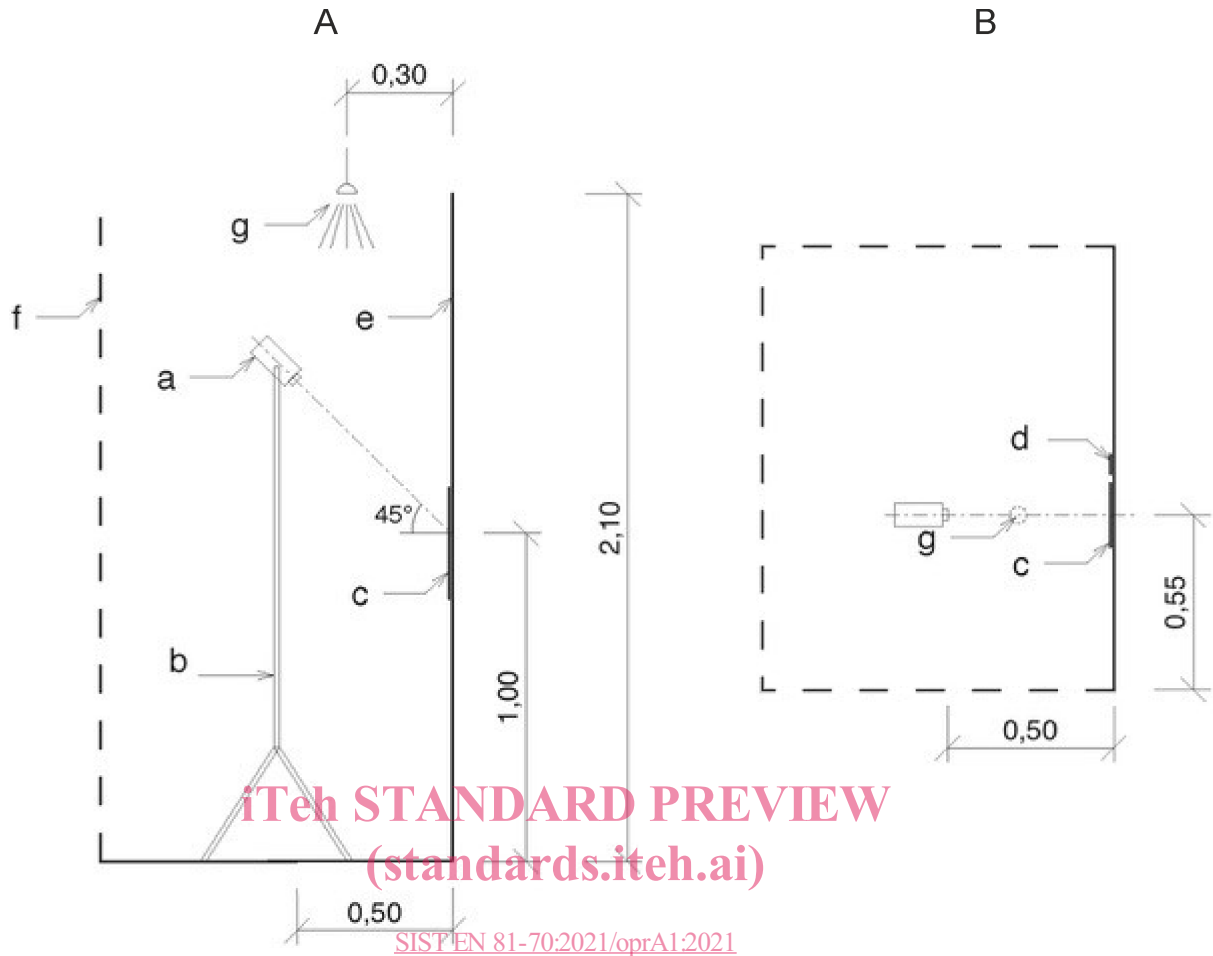
This approximation can be used for an initial selection of colours for design purposes or for preliminary assessments at site. It does not accurately assess the influence of gloss on the light reflectance value. If this method for determination of luminance contrast is chosen, an adequate margin to the required minimum luminance contrast should be applied to ensure compliance with this document.

E.2.2 Determination of luminance contrast of control devices

For determination of luminance contrast of symbols on the active part of control devices it is recommended to use luminance meter cameras due to the small size of symbols.

The arrangement of measurements using luminance meter cameras in laboratories should be as follows (see Figure E.1):

1. the measurement device should be mounted on a tripod and positioned in the axis of the control device at a distance of 0,50 m,
2. the viewing angle should be 45° above horizontal,
3. the control device and the LRV standard sample should be mounted on a wall, with the centre lines of the button and of the sample at a height of 1 m,
4. a lift car of 1,10 m x 1,40 m should be simulated by panels or curtains, shielding any disturbing illumination,
5. a punctual light source, dimmable to provide the required illuminance of 100 lx, should be positioned at a height of 2,10 m and a distance of 0,30 m to the wall.



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Key

- A side view
- B top view
- a luminance meter camera (measurement device)
- b tripod
- c control devices to be measured
- d LRV standard sample
- e wall
- f car walls, in laboratory substituted by curtains or panels
- g dimmable punctual light source to provide the required illumination on the sample

Figure E.1 — Measurements set up for determination of luminance contrast on control devices

When control devices are in compliance with the luminance contrast requirements according to the above measurement it can be assumed that they also meet the requirements for larger cars and for arrangements on landings.

E.2.3 Determination of light reflectance values

Light reflectance values of active parts of push buttons, face plates and their surrounding surfaces can be determined in a similar way as defined in E.2.2, however under a viewing angle according to Table 2, or by the use of other measurement methods as listed in E.2.1.

EN 81-70:2021/prA1:2021 (E)**E.2.4 Determination of luminance contrast of lift designation markings**

Luminance contrast and LRV_1 of lift designation markings to their background can be determined in a similar way as defined in E.2.2, however under a horizontal viewing angle with a distance of 0,5 m to 1,0 m, or by the use of other measurement methods as listed in E.2.1 if the size of the sign and the reflection of material allows for the use of other methods."

3 Modification to the Bibliography

Add the following new entry:

"[16] EN ISO/CIE 11664-3:2019, *Colorimetry - Part3: CIE Tristimulus Values*".

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