



SLOVENSKI STANDARD

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Nadomešča:

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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 lifts - Part 70: Accessibility to lifts for persons including persons with disability

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

Règles de sécurité pour la construction et l'installation des ascenseurs - 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 81-70:2018

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91.140.90 Dvigala. Tekoče stopnice Lifts. Escalators

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EUROPEAN STANDARD

EN 81-70

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2018

ICS 91.140.90

Supersedes EN 81-70:2003

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 ascenseurs - 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 European Standard was approved by CEN on 26 June 2017.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 81-70:2018) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, the secretariat of which is held by AFNOR.

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 November 2018, and conflicting national standards shall be withdrawn at the latest by May 2020.

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

This document supersedes EN 81-70:2003 and EN 81-70:2003/A1:2004.

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 this document.

EN 81-70:2018 is a full revision of the standard which reflects developments since the publication of EN 81-70:2003 and experience gained from its application. Consequently, most clauses have been changed. The main changes can be identified as:

- the addition of detailed specifications for contrast requirements;
- the increase of door widths;
- the deletion of items which are now covered by EN 81-20 (protection device on doors, stopping and levelling accuracy);
- the addition of two more lift car types;
- the clarification of arrangement and design of handrails;
- improved requirements for the design and arrangement of control devices and indicators;
- improved requirements for the arrangement of landing controls for lift groups;
- the addition of detailed requirements for landing control devices for destination control systems using touch screens;
- the clarification of requirements for extra large buttons;
- the deletion of previous Annexes A, C, D and E which included background and guidance information. Some of this information has been transferred into normative requirements. For remaining information, reference to ISO 21542 has been added.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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.

EN 81-70:2018 (E)**0 Introduction****0.1 General**

This standard is a type C standard as stated in EN ISO 12100:2010.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered is indicated in the scope of this standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards for lifts that have been designed and built according to the provisions of this type C standard.

0.2 Principles

For the revision of this standard the following have been considered:

- a) practical experience with the first version of this standard;
- b) market demand for including new technology;
- c) CEN-CENELEC Guide 6;
- d) current legal framework for accessibility and usability, in particular:

The non-discrimination clause (art 6a) based on disability and age of Article 19 of consolidated version 2016 of the Treaty of Lisbon of the European Union requests a new understanding of diversity of users in the built environment (transport and products), similar to that established in information and communication technologies.

The UN Convention on the Rights of Persons with Disabilities with reference also to accessibility in the built environment – considering human diversity, social inclusion and equality for all people - is the first ratified EU agreement on human rights and ratified also by most Member States. It is also the first international legally binding instrument on human rights setting minimum standards for the rights for people with disabilities around the world.

0.3 Assumptions

Intensive studies have been made on the different categories of disability to establish related hazards and their risks (see Annex A).

The application of this standard is based on following assumptions:

- a) It is the responsibility of national building regulations to specify in which buildings accessible lifts according to this standard will be installed.
- b) National building regulations will not conflict with the provisions of this standard.
- c) Obstacle-free accessibility on the landing floors is provided on all eligible floors.
- d) Visual and tactile floor guidance systems for finding lifts and their landing control stations in a building are considered by building planners and building designers.

0.4 Negotiations

It is assumed that negotiations have been made for each contract between the customer and the supplier/installer about:

- a) the intended use of the lift, particularly concerning the kind of expected passengers which may have an impact on the selection of appropriate and optional solutions of this standard (e.g. for buildings where a higher level of accessibility may be foreseen according to Annex D);
- b) temporary activation of specific features of the lift;
- c) environmental conditions;
- d) civil engineering problems;
- e) other aspects related to the place of installation e.g. how to ensure guidance to passengers about the specific operational features of the lift.

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EN 81-70:2018 (E)**1 Scope**

This European Standard specifies the minimum requirements for the safe and independent access and use of lifts by a wide range of persons, including persons with disabilities.

It is applicable to new passenger and goods passenger lifts according to EN 81-20. For other types of lifts, e.g. inclined lifts according to EN 81-22, this standard can usefully be taken as a basis.

NOTE 1 For guidance on solutions for increased accessibility and usability see Annex D.

NOTE 2 For the upgrading of accessibility of existing lifts in line with the recommendation of the European Commission dated 8th of June, 1995 (95/216/EC) concerning improvements to safety of existing lifts, see EN 81-82.

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 81-20:2014, *Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 20: Passenger and goods passenger lifts*

EN 81-28:2018, *Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 28: Remote alarm on passenger and goods passenger lifts*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

ISO 4190-5:2006, *Lift (Elevator) installation — Part 5: Control devices, signals and additional fittings*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and EN 81-20:2014 and the following apply.

3.1 collective control system

lift control system where required direction of travel is registered on the landing and the destination floor is registered in the car

3.2 destination control system

lift control system where the destination floor is registered on the landing

3.3 accessibility button

means to activate enhanced accessibility features or services for a single trip

4 Significant hazards and barriers to accessibility

This clause contains all significant hazards, hazardous situations and events as far as they are dealt with in this standard, identified by risk assessment as significant for this type of machinery and which require actions to eliminate or reduce the risk (see Table 1).

In this European Standard, barriers to accessibility and additional risks encountered by the person with disability or by the devices used by that person are identified particularly in Table 1, No 8 (ergonomic hazards).

Table 1 — List of significant hazards

No	Hazards listed in EN ISO 12100:2010, Annex B	Relevant clauses
1	Mechanical hazards due to:	
	Crushing	5.3.2.3
	Impact	5.3.2.3
	Slip, trip, fall	5.3.2.4
8	Ergonomic hazards due to:	
	Access	5.2.1, 5.2.2, 5.3.1, 5.3.2.3
	Design or location of indicators, visual and audible display units	5.1.3, 5.4.2.4, 5.4.2.5, 5.4.3.3, 5.4.3.4
	Design, location or identification of control devices	5.1.2, 5.4.2.1, 5.4.2.2, 5.4.2.3, 5.4.3.1, 5.4.3.2
	Effort	5.3.2.1, 5.3.2.2

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5 Safety requirements and/or protective measures

5.1 General

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5.1.1 Passenger and goods passenger lifts shall comply with the safety requirements and/or protective measures of the following clauses. In addition, passenger and goods passenger lifts shall be designed according to the principles of EN ISO 12100 for hazards relevant but not significant which are not dealt with by this document (e.g. sharp edges).

The requirements of EN 81-20 and EN 81-28 apply with additional requirements elaborated below.

5.1.2 Where luminance contrast between adjacent surfaces is required the difference in light reflectance value (LRV) shall comply with Table 2.

Light reflectance values under viewing angles according to Table 2 taking into account lighting conditions and reflections of ceilings, walls and floors may be determined by a black and white photo of a sample with an adjacent LRV scale and comparing surfaces of the sample with the LRV scale. Alternatively, by placing a LRV scale against the surface of interest, a reasonable match can be identified.

NOTE On shiny and direct reflective surfaces, unfavourable reflections can reduce luminance contrast determined by LRV-method. Light colour tones for ceiling and wall surfaces, diffuse reflective materials and a wide light distribution prevent disturbing reflections on the controls. For further guidance on contrast see ISO 21542:2011, B.7.2.

Table 2 — Minimum difference of light reflectance value (LRV)

Clause	Item	At landings		In the car	
		Minimum LRV point difference	Viewing angle	Minimum LRV point difference	Viewing angle
Table 4, item c)	Active part of push buttons to their surrounding	30	45° above horizontal	30	45° above horizontal
Table 4, item d)	Face plate to its surrounding	30	Perpendicular	30	Perpendicular
Table 4, item j)	Symbols on push buttons to active areas	30 (60 recommended)	45° above horizontal	30 (60 recommended)	45° above horizontal
5.4.3.3 c)	Lift identification to background	30 (60 recommended)	Perpendicular	-	-

5.1.3 When an audible signal or voice announcement is required, the sound level shall be adjustable between 35 dB(A) and at least 65 dB(A) and to suit the site conditions. In noisy environments (e.g. on landings in train stations) the maximum sound level shall be adjustable up to 80 dB(A) (see 0.4). The means of adjustment shall be accessible only to authorized persons.

5.2 Entrances – Door openings

5.2.1 The landing and car doors shall be automatic power operated horizontally sliding doors.

The clear opening width shall be at least 800 mm for type 1 cars, 900 mm for type 2, type 3 and type 4 cars and 1 100 mm for type 5 cars. In existing buildings, the clear opening width shall be at least 800 mm for type 2 cars.

5.2.2 The door dwell time shall be adjustable at least between 2 s and 20 s to suit the conditions where the lift is installed (see 0.4). The means of adjustment shall be accessible only to authorized persons.

NOTE A door dwell time of at least 6 s is needed for persons with reduced mobility (see also 5.4.2.2.3).

A door close button may be provided to reduce the door dwell time.

5.3 Car dimensions and equipment in the car

5.3.1 Car dimensions

The inside dimensions of cars with a single entrance or with two opposite or two adjacent entrances shall be chosen in accordance with Table 3 (see 0.4).

Car dimensions shall be measured between the structural car walls. Decorative finishes on each wall that reduce the minimum car dimensions given by Table 3 shall not exceed 15 mm in thickness.

There shall be no additional features attached to the car walls below a height of 800 mm which may restrict the accommodation and turning of passengers using wheelchairs or passengers with other walking aids. This would particularly be the case for type 1 and type 2 cars restricting the minimum depth and for type 4 cars restricting the smaller minimum dimension.

Table 3 — Minimum car dimensions for cars with a single entrance or two entrances

Type of car	Minimum car dimensions ^a	Accessibility level	Building types, usage	Remarks
1	Car width: 1 000 mm Car depth: 1 300 mm (450 kg)	This car accommodates one wheelchair user without an accompanying person.	Shall only be used in existing buildings where building constraints do not permit the installation of a type 2 car.	Type 1 provides only limited accessibility for persons using a manual wheelchair as described in EN 12183:2014 or an electrically powered wheelchair of class A described in EN 12184:2014. This type also provides accessibility for persons using walking aids (e.g. a walking stick) and for persons with sensory and intellectual disabilities.
2	Car width: 1 100 mm Car depth: 1 400 mm (630 kg)	This car accommodates one wheelchair user and an accompanying person.	Shall be the minimum size for new buildings.	Type 2 provides accessibility for persons using a manual wheelchair as described in EN 12183:2014 or an electrically powered wheelchair of class A or B as described in EN 12184:2014. This type also provides accessibility for persons using walking aids (e.g. walking sticks, crutches or rollators). Passengers with wheelchairs or walking aids are unlikely to be able to turn around in this type of car and have to leave the car backwards.
3	Car width: 1100 mm Car depth: 2100 mm (1 000 kg)	This car accommodates one user with a wheelchair of class C and some other passengers. It also allows transport of stretchers.	Recommended size for cars in public areas (e.g. outdoor facilities, stations, etc.) and for cars where transport of wheelchairs of class C shall be provided	Type 3 provides accessibility for persons using a manual wheelchair as described in EN 12183:2014 or an electrically powered wheelchair of class A, B or C described in EN 12184:2014. It also provides accessibility for persons using a manual wheelchair with tractor unit (propulsion attachment). When cars of this type are configured with two opposite entrances this can provide straight through circulation from the main entrance to different floor levels.
4	Car width: 1 600 mm Car depth: 1 400 mm	This car accommodates one wheelchair user and a few	Shall be the minimum size for cars with doors on adjacent walls ^b .	Type 4 provides accessibility for persons using a manual wheelchair as described in EN 12183:2014 or an

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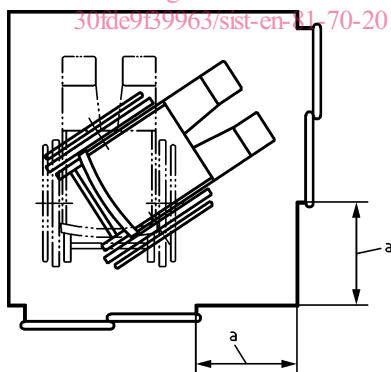
Type of car	Minimum car dimensions ^a	Accessibility level	Building types, usage	Remarks
	or Car width: 1 400 mm Car depth: 1 600 mm (1 000 kg)	other passengers. It also allows a wheelchair to be rotated within the car.		electrically powered wheelchair of class A or B as described in EN 12184:2014. Type 4 provides sufficient space for most wheelchairs users and for passengers with walking aids.
5	Car width: 2 000 mm Car depth: 1 400 mm or Car width: 1 400 mm Car depth: 2 000 mm (1 275 kg)	This car accommodates one wheelchair user and several other passengers. It also allows a wheelchair to be rotated within the car.		Type 5 provides accessibility for persons using a manual wheelchair as described in EN 12183:2014 or an electrically powered wheelchair of class A, B or C as described in EN 12184:2014. Type 5 provides sufficient turning space for persons using wheelchairs of class A or B and for persons using walking aids (e.g. walking frames, rollators, etc.).

^a The car width is defined as the horizontal distance between the inner surface of the structural walls of the car, measured parallel to the front entrance. The car depth is defined as the horizontal distance between the inner surfaces of the structural walls of the car, measured perpendicular to the width.

^b The distances between doors and adjacent car walls as shown in Figure 1 should be as large as possible.

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**Key**

a distance between door and adjacent car wall

Figure 1 —Cars with doors on adjacent walls

5.3.2 Equipment in the car

5.3.2.1 A handrail shall be installed on the side wall where the car operating panel is located as follows:

- a) the handrail shall be interrupted where the car operating panel is located in order to avoid obstructing control devices;