SLOVENSKI STANDARD
SIST EN 81-71:2022

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Nadomešča:
SIST EN 81-71:2018+AC:2019

Varnostna pravila za konstruiranje in vgradnjo dvigal (liftov) - Posebne izvedbe osebnih in osebno-tovornih dvigal - 71. del: Dvigala, odporna proti vandalizmu

Safety rules for the construction and installation of lifts - Particular applications to passenger lifts and goods passenger lifts - Part 71: Vandal resistant lifts

Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen - Besondere Anwendungen für Personen- und Lastenaufzüge - Teil 71: Schutzmaßnahmen gegen mutwillige Zerstörung

Règles de sécurité pour la construction et l'installation des élévateurs - Applications particulières pour les ascenseurs et ascenseurs de charge - Partie 71 : Ascenseurs résistants aux actes de vandalisme

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13.310	Varstvo pred kriminalom	Protection against crime
91.140.90	Dvigala. Tekoče stopnice	Lifts. Escalators

SIST EN 81-71:2022 **en,fr,de**

EUROPEAN STANDARD

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EN 81-71

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English Version

Safety rules for the construction and installation of lifts - Particular applications to passenger lifts and goods passenger lifts - Part 71: Vandal resistant lifts

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This European Standard was approved by CEN on 20 April 2022.

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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
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European foreword

This document (EN 81-71:2022) 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of an identical text or by endorsement, at the latest by November 2022, and conflicting national standards shall be withdrawn at the latest by May 2024.

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 81-71:2018+AC:2019.

In comparison with the previous edition, the following significant changes have been made:

— reference to Category 0 has been removed;

— normative references have been updated;

— Annex ZA has been modified.

No technical changes have been made in Clause 5 during this revision.

This document is intended to be used in conjunction with EN 81-20:2020, which gives the basic requirements for passenger and goods passenger lifts.

This document is part of the EN 81 series of standards. The structure of the EN 81 series is described in CEN/TR 81-10:2008.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, 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 the United Kingdom.

Introduction

This document is a type-C standard as stated in EN ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e.g. for maintenance (small, medium and large enterprises);

— consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate in the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

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

This document provides requirements for the design of lifts where it is considered that additional measures are required in order to protect against the risk of vandalism. Every lift is subject to some amount of careless and rough use. Additional protective measures against deliberate acts that may result in equipment damage or injury to persons are referred to in this document as Category 1 or Category 2.

The following assumptions were made whilst writing this document:

— The potential for vandalism of lifts depends on the following factors:

  — access to the lift installation;

  — the surrounding area;

  — observation of the lift by others in the vicinity;

  — the extent of building security and surveillance of the lift;

  — period of access to the building, including the lift (24 h);

  — vulnerability of lift.

— The forces exerted on the lift and its equipment will be as a result of manual effort or by item(s) such as those listed in Annex E.

1 Scope

This document defines requirements addressing the significant hazards related to lifts, which are subject to different expected levels of vandalism (see Annex A and Annex D for further information).

Those requirements are supplementary (additional and/or modified) to the requirements of EN 81-20:2020, intended to mitigate the effect of vandalism.

This document is not applicable to lifts installed before the date of its publication.

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.

EN 81-20:2020, *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 81-28:2022, *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 81-72:2020, *Safety rules for the construction and installation of lifts — Particular applications for passenger and goods passenger lifts — Part 72: Firefighters lifts*

EN 81-73:2020, *Safety rules for the construction and installation of lifts — Particular applications for passenger and goods passenger lifts — Part 73: Behaviour of lifts in the event of fire*

EN 13501-1:2018, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 60529:1991,[1] *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, EN 81-20:2020 and the following apply.

ISO and IEC maintain terminological 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
car ceiling
parts of the car roof accessible from inside the car

[1] As impacted by EN 60529:1991/A1:2000, EN 60529:1991/A2:2013 and EN 60529:1991/A2:2013/AC:2019-02.

3.2
category 1 lift
lift which is protected against limited act of vandalism

Note 1 to entry: For guidance on selection of the relevant category see Annex A.

3.3
category 2 lift
lift which is protected against strong act of vandalism

Note 1 to entry: For guidance on selection of the relevant category see Annex A.

4 List of significant hazards

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

Table 1 — List of significant hazards

Hazards as listed in EN ISO 12100:2010, Annex B	Relevant clauses
Mechanical hazards due to:	
– Crushing	5.2.1.2, 5.2.1.3, 5.2.2.1, 5.2.2.2, 5.3.5, 5.4.2.1, 5.4.2.4 and 5.5.2
– Shearing	5.2.1.1, 5.2.1.2, 5.2.1.3, 5.2.2.1, 5.2.2.2, 5.2.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5, 5.4.1.2, 5.4.1.3, 5.4.1.4, 5.4.1.6, 5.4.2.1, 5.4.2.4, 5.5.1.1 and 5.5.2
– Cutting	5.4.1.2, 5.5.1.8, 5.5.4, 5.6.1.3 and 5.6.2.1
– Trapping	5.4.2.3, 5.4.2.4, 5.4.2.5, 5.4.5 and 5.7
– Impact hazard	5.4.4
– Slipping, tripping and falling	5.2.1.1, 5.2.2.2, 5.2.3, 5.3.3, 5.3.4, 5.3.5, 5.3.6, 5.4.1.2, 5.4.1.3, 5.4.2.1, 5.4.2.3, 5.4.2.4, 5.4.6, 5.5.1.1, 5.5.1.6, 5.5.2 and 5.8
Electrical hazards due to live parts	5.5.1.9, 5.5.4, 5.6.1.1, 5.6.1.3, 5.6.1.4 and 5.6.2.1
Thermal hazards due to flame	5.2.1.1, 5.3.1, 5.3.7, 5.4.1.1, 5.5.1.4, 5.5.4, 5.6.1.1, 5.6.1.5 and 5.9
Hazards due to human behaviour	5.2.1.1, 5.2.1.2, 5.2.1.3, 5.2.2.1, 5.2.2.2, 5.2.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5, 5.3.6, 5.4.1.5, 5.4.1.6, 5.4.1.7, 5.4.1.8, 5.4.2.1, 5.4.2.3, 5.4.3, 5.4.4, 5.4.5, 5.4.6, 5.5.1.1, 5.5.1.2, 5.5.1.3, 5.5.1.5, 5.5.1.7, 5.5.1.8, 5.5.1.9, 5.5.2, 5.5.3, 5.5.4, 5.6.1.2, 5.6.1.3, 5.6.1.4, 5.6.2.1, 5.6.2.2, 5.7 and 5.9

5 Safety requirements and/or protective measures

5.1 General

Category 1 and Category 2 lifts shall comply with the safety requirements and/or protective measures of the following clauses. Where a category is specified, the subclause applies to that category only. In addition, lifts shall be designed according to the principles of EN ISO 12100:2010 for hazards relevant but not significant that are not dealt with by this document.

5.2 Lift well

5.2.1 Well enclosure

5.2.1.1 Well enclosures shall be imperforate. The walls, floor and ceiling shall be made of materials such as steel, brick, concrete, etc. with a mechanical strength such that when a force of 2 500 N being evenly distributed over an area of 100 cm^2 in round or square section is applied at right angles to the surface at any point on either face they shall resist without:

a) permanent deformation;

b) elastic deformation greater than 15 mm.

The materials used for the well enclosure shall be non-combustible, e.g. according to Class A1 of EN 13501-1:2018.

If the material used is glass, it shall be of an equivalent strength to the glass used for landing doors – see 5.4.1.

5.2.1.2 For Category 1 lifts with a partially enclosed well the height of the enclosure according to EN 81-20:2020, 5.2.5.2.3 b) shall be a minimum of 5,0 m.

5.2.1.3 Category 2 lifts shall be provided with a totally enclosed well.

5.2.2 Access and emergency doors - Access trap doors - Inspection doors

5.2.2.1 Access and emergency doors, access trap doors and inspection doors shall be of such a construction that it is not possible to open them with any of the items as listed in Table E.1.

5.2.2.2 Access and emergency doors, access trap doors and inspection doors in their locked position shall withstand a force of 2 500 N applied:

— from the side which is normally accessible to persons,

— at right angles to the panel,

— at any point on the exposed face,

— evenly distributed over an area of 100 cm^2 of round or square section;

they shall:

a) resist the force without permanent deformation;

b) resist without elastic deformation greater than 15 mm;

c) not have their safety function affected during and after such a test;

d) operate afterwards.

5.2.3 Ventilation

Ventilation openings shall be in accordance with 5.3.3 and 5.3.4.

5.3 Machinery spaces, pulley rooms and machinery cabinets

5.3.1 The materials used in the construction of any machinery space, pulley room or machinery cabinet outside of the well shall comply with 5.2.1.1.

5.3.2 Windows, if provided and accessible to persons, shall:

a) be of a strength as specified in 5.2.2.2;

b) have laminated glass panel(s).

Windows are not recommended.

5.3.3 If ventilation openings are accessible to persons from the outside, individual openings shall:

a) not be greater than 250 mm × 250 mm;

b) be provided with a means of protection so that a straight rod of any cross section, shall not pass through.

5.3.4 The means of protection in 5.3.3 shall be of a strength as specified in 5.2.1.1.

5.3.5 Doors and access trap doors with their locks shall meet the requirements of 5.2.2.2.

5.3.6 For Category 2 lifts, an intruder alarm system shall operate if any of the following doors are opened:

— machine room and/or pulley room door;

— inspection doors, emergency doors and access trap doors;

— machinery cabinet doors.

The intruder alarm system shall operate an audible alarm within 30 s after opening any of the above doors.

The audible alarm shall:

a) be audible at both the point of intrusion and at the main access floor, with an adjustable sound level between 70 dB(A) and 85 dB(A);

b) stop automatically after an adjustable period between 5 min and 15 min.

It shall be possible to deactivate and re-activate the alarm system by the device referred to in 5.4.2.2.

In the event of loss of the electrical supply, the alarm system shall remain operative for at least two hours.

5.3.7 In the case of a Category 2 lift, machinery located in the pit, e.g. machine, tank, controller, shall be covered with a metallic enclosure. This enclosure is to prevent rubbish from entering the equipment and causing dangerous malfunctions or the ignition of the material or the creation of smoke.

5.4 Landing and car doors

5.4.1 Landing and car doors shall be of the automatically horizontally sliding power operated type.

5.4.1.1 Materials used for car and landing doors shall comply with the following:

a) with the exception of decorative finishes, the materials used for door panels and frames/architraves shall be non-combustible according to Class A1 or A2 of EN 13501-1:2018;

b) for Category 2 lifts the materials used for decorative finishes shall be non-combustible according to Class A1 or A2 of EN 13501-1:2018.

5.4.1.2 Independently of their material, landing and car door assemblies, together with their frames and fixings shall withstand the soft pendulum shock test as specified in EN 81-20:2020, 5.3.5.3.4 a) without component failure or permanent deformation which would affect the proper function of the doors, but with the pendulum fall height as:

a) for Category 1 lifts: 700 mm;

b) for Category 2 lifts: 1 000 mm.

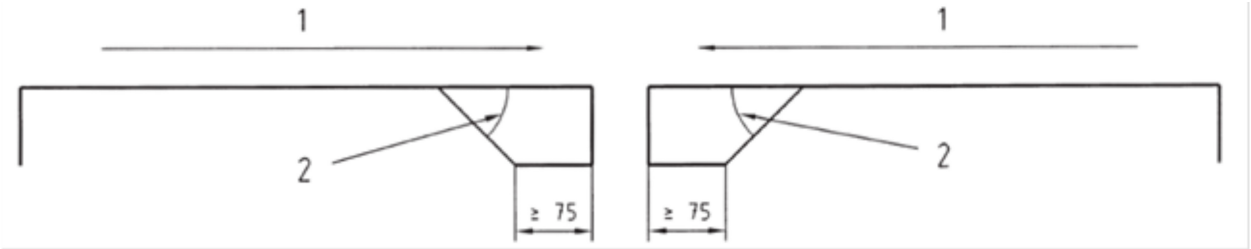
The door assemblies shall remain operative after the test.

5.4.1.3 Door panels with their retainers shall withstand the soft pendulum shock test as specified in EN 81-20:2020, 5.3.5.3.2 with a falling height increased to 1 400 mm.

5.4.1.4 For Category 2 lifts glass panels shall not be used.

5.4.1.5 For Category 2 lifts, the distance between each landing door panel, or its attachments at the leading edge, and the car door(s) panel(s), or its attachments at the leading edge, shall not exceed 35 mm. This distance shall be maintained back from the leading edge over a length of not less than 75 mm and returned at an angle not exceeding 45° to the rear of the door panel. This return angle may be omitted over a length not exceeding 200 mm at the top and/or bottom of the door panel to allow the fixing of door equipment. Where the distance is maintained back for a length of 200 mm or more, then the return angle is not required (see Figure 1).

Dimensions in millimetres



Key

1 direction of closing

2 return angle: maximum 45°

Figure 1 — Plan view of door panel with angled return