SLOVENSKI STANDARD
oSIST prEN 81-42:2022

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Varnostna pravila za konstruiranje in vgradnjo dvigal (liftov) - Posebna dvigala za prevoz oseb in blaga - 42. del: Navpična dvižna naprava z zaprtim nosilcem, namenjena za uporabo osebam, vključno z invalidi

Safety rules for the construction and installation of lifts - Special lifts for the transport of persons and goods - Part 42: Vertical lifting appliance with enclosed carrier intended for use by persons, including persons with disability

Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen - Spezialaufzüge für die Beförderung von Personen und Gütern - Teil 42: Vertikale Hebezeuge mit geschlossenem Lastträger für Personen und Personen mit Behinderung

Règles de sécurité pour la construction et l'installation des élévateurs - Élévateurs spéciaux pour le transport des personnes et des charges - Partie 42 : Élévateurs verticaux à habitacle clos destiné à l'usage de personnes, y compris de personnes en situation de handicap

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91.140.90	Dvigala. Tekoče stopnice	Lifts. Escalators

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Safety rules for the construction and installation of lifts - Special lifts for the transport of persons and goods - Part 42: Vertical lifting appliance with enclosed carrier intended for use by persons, including persons with disability

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

If this draft becomes a European Standard, 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.

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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 (prEN 81-42:2022) 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 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.

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.

Introduction

0.1 General

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

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.

0.2 General remarks

0.2.1 The object of this document is to define safety rules related to passenger lifting appliances with a view to safeguarding persons and objects against the risk of accidents associated with the normal use, maintenance and emergency operation of lifting appliances.

a) Persons to be safeguarded:

   1) users, including passengers and competent and authorized persons, e.g. maintenance and inspection personnel (see EN 13015:2001+A1:2008);

   2) persons in the surrounding area of the well, or any machinery spaces, who may be affected by the lifting appliance.

b) Property to be safeguarded:

   1) loads in carrier;

   2) components of the lifting appliance installation;

   3) building in which the lifting appliance is installed;

   4) the immediate surrounding area of the lifting appliance installation.

NOTE Even if EN 81-71:2018+AC:2019 and EN 81-77:2018 do not apply to lifting appliances covered by this document, they give additional requirements covering lifts resistant to acts of vandalism and lifts in seismic conditions.

0.2.2 A study has been made of the various possible hazards with lifting appliances (see Annex I).

0.2.3 When the weight, size and/or shape of components prevent them from being moved by hand, they are either:

a) fitted with attachments for lifting gear; or

b) designed so that they can be fitted with such attachments (e.g. by means of threaded holes); or

c) shaped in such a way that standard lifting gear can be attached.

0.2.4 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.

0.3 Principles

0.3.1 In drawing up this document the following principles have been used.

0.3.2 This document does not repeat all the general technical rules applicable to every electrical, mechanical, or building construction including the protection of building elements against fire.

It has, however, been necessary to establish certain requirements of good construction, either because they are peculiar to lifting appliance manufacture or because in the case of lifting appliance utilization the requirements may be more stringent than elsewhere.

0.3.3 This document states minimum rules for the installation of lifting appliances into buildings/constructions. Some countries can have regulations for the construction of buildings, etc. which cannot be ignored.

Typical clauses affected by this are those defining minimum values for the height of the machine rooms, for their access doors dimensions and for protection for fire.

0.3.4 As far as possible the standard sets out only the requirements that materials and equipment have to meet in the interests of safe operation of lifting appliances.

0.3.5 Risk analysis, terminology and technical solutions have been considered taking into account the methods of EN ISO 12100:2010, EN ISO 14798:2013 and the EN 61508:2010 series of standards.

0.3.6 In order for EN 81-42 to be a widely applicable standard the average weight of a person has been determined to be 75 kg.

0.4 Assumptions

0.4.1 In drawing up this document the following assumptions have been made:

0.4.2 Information have been exchanged between the customer and the supplier and agreement reached about:

a) the intended use of the lifting appliance, including the type and mass of the handling devices intended to be used to load and unload the carrier, if any;

b) environmental conditions such as temperature, humidity, exposure to sun or wind, snow, corrosive atmosphere;

c) civil engineering problems (for example, building regulations);

d) other aspects related to the place of installation;

e) the dissipation of heat from the components/equipment of the lifting appliance which would require ventilation of the well and/or the machinery space/location of equipment;

f) information concerning the aspects relating to noise and vibrations emitted by the equipment;

g) operation in the event of fire alarm and exclusive use of the well and the machinery spaces (see 4.2.1.2 and 4.3.12).

0.4.3 Relevant risks have been considered for each component that may be incorporated in a complete lifting appliance installation and rules have been drawn up accordingly:

Components are:

a) designed in accordance with usual engineering practice and calculation codes, taking into account all failure modes;

b) of sound mechanical and electrical construction;

c) made of materials with adequate strength and of suitable quality;

d) free of defects;

e) free from harmful materials, e.g. asbestos.

0.4.4 Components are kept in good repair and working order, so that the required dimensions remain fulfilled despite wear. All lifting appliance components are considered as requiring inspection to ensure safe continued operation during their use.

The operational clearances specified in the standard should be maintained not only during the verification and tests before the lifting appliance is put into use, but also throughout the life of the lifting appliance.

NOTE Components not requiring maintenance (e.g. maintenance free, sealed for life) are still required to be available for inspection.

0.4.5 Components are selected and installed so that foreseeable environmental influences and special working conditions do not affect the safe operation of the lifting appliance.

0.4.6 By design of the elements holding a load, safe normal operation of the lifting appliance is ensured for loads ranging from 0 % to 100 % of the rated load, plus any designed overload capacity (see 4.4.1.2.1.2).

0.4.7 The requirements of this document are such that the possibility of a failure of an electric safety device or a safety component complying with all the requirements of this document needs not to be taken into consideration.

0.4.8 Users have to be safeguarded against their own negligence and unwitting carelessness when using the lifting appliance in the intended way.

0.4.9 A user may, in certain cases, make one imprudent act. The possibility of two simultaneous acts of imprudence and/or the abuse of instructions for use is not considered.

0.4.10 If in the course of maintenance work a safety device, normally not accessible to the users, is deliberately neutralized, safe operation of the lifting appliance is no longer ensured, but compensatory measures will be taken to ensure users safety in conformity with maintenance instructions.

It is assumed that maintenance personnel are instructed and work according to the instructions.

0.4.11 Horizontal forces and energies to consider are indicated in the applicable clauses of the standard. Typically, where not otherwise specified in this document, the energy exerted by a person results in an equivalent static force of:

a) 300 N;

b) 1000 N where impact can occur.

0.4.12 With the exception of the items listed below which have been given special consideration, a mechanical device built according to good practice and the requirements of this document, including uncontrolled slipping of the suspension means on the traction sheave, will not deteriorate to a point of creating hazard without the possibility of detection provided that all of the instructions given by the manufacturer have been duly applied:

a) breakage of the suspension;

b) breakage and slackening of all linkage by auxiliary ropes, chains and belts;

c) failure of one of the mechanical components of the machine brake which take part in the application of the braking action on the drum or disk;

d) failure of a component associated with the main drive elements and the traction sheave;

e) rupture in the hydraulic system (jack excluded);

f) small leakage in the hydraulic system (jack included).

0.4.13 The possibility of the safety gear not engaging, should the carrier free fall from a stationary position at the lowest landing, before the carrier strikes the buffer(s), if any, is considered acceptable.

0.4.14 Means of access are provided for the hoisting of heavy equipment (see 0.4.2 d)).

0.4.15 To ensure the safe functioning, the operating temperature range of the equipment has to take into account the conditions of the place of use of the machinery, inside the maximum range of ambient temperature between +5 °C and +40 °C. For very hot or cold environments, extra requirements may be necessary.

NOTE See HD 60364-5-51:2009, Code AA5.

0.4.16 The well is suitably ventilated, according to national building regulation, taking into consideration the heat output as specified by the manufacturer, the environmental conditions of the lifting appliance and the limits given in 0.4.15, e.g. ambient temperature, humidity, direct sunlight, air quality and air tightness of buildings due to energy saving requirements.

NOTE See 0.4.2 and A.3 for further guidance.

0.4.17 Access ways to the working areas are adequately lit (see 0.4.2).

0.4.18 Minimum passageways, corridors, fire escapes, etc. are not obstructed by the open door/trap of the lifting appliance and/or any protection means for working areas outside of the well, where fitted according to the maintenance instructions (see 0.4.2).

0.4.19 Where more than one person is working at the same time on a lifting appliance, an adequate means of communication between these persons is ensured.

0.4.20 The fixing system of guards, used specifically to provide protection against mechanical, electrical or any other hazards by means of a physical barrier, which have to be removed during regular maintenance and inspection, remains attached to the guard or to the equipment when the guard is removed.

0.4.21 The fluids used for the operation of hydraulic lifting appliances are according to EN ISO 6743-4:2015.

0.4.22 In case of public access, it is assumed that the owner will carry out the following:

a) ensure that the lifting appliance is connected to a rescue service;

b) keep the alarm device in working conditions at all times to provide 2-way communication with a rescue service;

c) make at least a check every 72 hours of the voice response coming from the rescue service;

d) immediately contact the rescue service, if the device is not working.

1 Scope

1.1 This document specifies safety requirements for construction, manufacturing, installation, maintenance, inspection and dismantling of permanently installed electrically powered vertical lifting appliances affixed to a building structure intended for use by persons, including persons with disability:

— travelling vertically between predefined levels along a guided path whose inclination to the vertical does not exceed 15°;

— supported or sustained by rack and pinion, rope traction drive, noncircular elastomeric-coated suspension means (hereafter called traction belts) traction drive, rope positive drive, chains, toothed belts, screw and nut, guided chain, scissors mechanism or hydraulic jack (direct or indirect);

— with enclosed wells;

— with a rated speed not greater than 0,15 m/s;

— with the carrier completely enclosed.

1.2 This document does not cover:

— hydraulic lifting appliances where the setting of the pressure relief valve (4.8.3.5.3) exceeds 50 MPa;

— operation in severe conditions (e.g. extreme climates, strong magnetic fields);

— lightning protection;

— operation subject to special rules (e.g. potentially explosive atmospheres);

— handling of materials, the nature of which could lead to dangerous situations;

— lifting appliances whose primary function is the transportation of goods;

— lifting appliances prone to vandalism;

— earthquakes, flooding;

— firefighting and evacuation;

— noise and vibrations;

— the design of concrete, hard core, timber or other foundation or building arrangement;

— the design of anchorage bolts to the supporting structure;

— the transport of type-C wheelchairs as defined in EN 12183:2014 and/or EN 12184:2014;

— vertically sliding doors.

NOTE Noise and vibration are not considered significant nor relevant hazards.

1.3 This document deals with all significant hazards, hazardous situations or hazardous events relevant to lifting appliance, when it is used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer. They have been identified by risk assessment; see Annex I.

1.4 This document is not applicable to lifting appliances manufactured 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 81-28:2018+AC:2019, *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 81-50:2020, *Safety rules for the construction and installation of lifts — Examinations and tests — Part 50: Design rules, calculations, examinations and tests of lift components*

EN 81-58:2018, *Safety rules for the construction and installation of lifts — Examination and tests — Part 58: Landing doors fire resistance test*

EN 81-70:2021, *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*

EN 10305-1:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 1: Seamless cold drawn tubes*

EN 10305-2:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 2: Welded cold drawn tubes*

EN 10305-3:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 3: Welded cold sized tubes*

EN 10305-4:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 4: Seamless cold drawn tubes for hydraulic and pneumatic power systems*

EN 10305-6:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 6: Welded cold drawn tubes for hydraulic and pneumatic power systems*

EN 12015:2014, *Electromagnetic compatibility — Product family standard for lifts, escalators and moving walks — Emission*

EN 12016:2013, *Electromagnetic compatibility — Product family standard for lifts, escalators and moving walks — Immunity*

EN 12385-1:2002+A1:2008, *Steel wire ropes — Safety — Part 1: General requirements*

EN 12385-5:2002, *Steel wire ropes — Safety — Part 5: Stranded ropes for lifts*

EN 12600:2002, *Glass in building — Pendulum test — Impact test method and classification for flat glass*

EN 13411-3:2004+A1:2008, *Terminations for steel wire ropes — Safety — Part 3: Ferrules and ferrule-securing*