SLOVENSKI STANDARD
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Varnostna pravila za konstruiranje in vgradnjo dvigal (liftov) - Posebne aplikacije za osebna in osebno-tovorna dvigala - 72. del: Dvigala za gasilce

Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts - Part 72: Firefighters lifts

Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen - Besondere Anwendungen für Personen- und Lastenaufzüge - Teil 72: Feuerwehraufzüge

Règles de sécurité pour la construction et l'installation des élévateurs - Applications particulières pour les ascenseurs et ascenseurs de charge - Partie 72 : Ascenseurs pompiers

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Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts - Part 72: Firefighters lifts

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This European Standard was approved by CEN on 15 June 2020.

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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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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 81-72:2020) 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of an identical text or by endorsement, at the latest by January 2021, and conflicting national standards shall be withdrawn at the latest by July 2022.

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 81-72:2015.

This document is a revision of EN 81-72:2015 in order to align its Annex ZA to the new format and requirements as laid out in the EU Commission Standardization Request "M/549 C (2016) 5884 final". During this revision no technical changes are made and the technical requirements of this document remain identical to EN 81-72:2015, with the exception of the normative references in the text which have been updated to the latest versions of the documents.

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 95/16/EC amended by 2006/42/EC and 2014/33/EU, see informative Annex ZA, which is an integral part of this document.

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 12100:2010.

Firefighters lifts are used to bring the firefighters and their equipment to the required floors.

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

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.

The following assumptions were made in writing this document.

Negotiations have been made between the owner, customer, building designers, fire authorities or other relevant bodies and installer concerning:

a) the intended use of the lift;

b) environmental conditions;

c) civil engineering problems;

d) interfaces between the lift and the building management system (BMS) or fire detection system;

e) the firefighting strategy;

f) smoke management, e.g. pressurizing system impact to the lift system such as sway of travelling cables and operation of landing doors;

g) water management, and where applicable, the highest permissible water level in the pit, e.g. 0,5 m;

h) other aspects related to the place of the installation and the rescue of persons from within the car;

i) power supply including regenerative power during secondary power supply operation;

j) size of safe area(s);

k) the need for an additional firefighters car key switch and availability of the key.

Developers and architects will need to take account of national building regulations in providing a suitable fire resistant structure of the building, safe areas, fire detection and extinguisher systems. Examples are shown in Annex B and Annex F.

1 Scope

1.1 This document specifies the additional or deviating requirements to EN 81-20:2020 for new passenger and goods passenger lifts, which can be used for firefighting and evacuation purposes under firefighters control.

1.2 This document applies, when the following conditions are fulfilled:

— the lift well and the lift environment are designed to restrict the ingress of fire, heat and smoke to the lift well, machinery spaces and safe areas;

— the building design limits the flow of water into the lift well;

— the firefighters lift is not used as an escape route;

— the lift well and the lift environment are fire protected for at least to the same level as the building structure;

— the power supply is secure and reliable;

— the electrical cable(s) providing power to the lift is fire protected to the same fire protection level as given to the lift well structure;

— a suitable maintenance and verification plan is implemented.

1.3 This document does not cover:

— the use of lifts with partially enclosed wells for use as firefighters lifts;

— lifts installed in new or existing buildings, which are not included in fire resisting building structure;

— important modification to existing lifts.

1.4 This document does not define:

— the number of firefighters lifts and the floors to be served during firefighting operations;

— size of safe area(s);

— the use of other than the highest deck of a multi deck lift for firefighting operations.

1.5 This document deals with the significant hazards, hazardous situations and events relevant to firefighters lifts (as listed in Clause 4) when they are used as intended and under the conditions as foreseen by the installer.

1.6 The following significant hazards are not dealt with in this document and are assumed to be addressed by the building designer:

— not having enough or correctly located firefighters lifts to move the firefighters up the building;

— a fire in the firefighters lift well, safe area, machinery space or car;

— the absence of building floor identification signs at any floor;

— water management is not operating correctly.

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 81-70:2018, *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 81-71:2018+AC:2019, *Safety rules for the construction and installation of lifts - Particular applications to passenger lifts and goods passenger lifts - Part 71: Vandal resistant 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 131-1:2015+A1:2019, *Ladders - Part 1: Terms, types, functional sizes*

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)*

ISO 8100-30:2019, *Lifts for the transport of persons and goods - Part 30: Class I, II, III and VI lifts installation*

3 Terms and definitions

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

3.1
control system
system of the lift which responds to input signals and generates output signals causing the equipment under control to operate in the desired manner

3.2
evacuation
organized and controlled movement of persons in a building from a dangerous place to a safe place

3.3
fire
combustion of material producing flame, heat and smoke

1) This document is impacted by the amendments EN 60529:1991/A1:2000 and EN 60529:1991/A2:2013.

3.4
fire compartment
sub-division of a building or buildings, e.g. by walls, doors and/or floors for the purpose of limiting the spread of fire and hot gases within the premises

3.5
firefighters lift
lift which has protection, controls and signals which enable it to be used under the exclusive control of the firefighters

3.6
fire protection
measures to prevent the outbreak of fire and fire spread in all cases to safeguard escape routes and create effective firefighting including the determination of the fire resistance, fire load and behaviour of building materials and structures during a fire

3.7
firefighters lift switch
switch located at the fire service access level, outside of the well and optionally in the car, used to initiate firefighters service

3.8
fire service access level
entry level in the building intended to be used by firefighters to gain access to the firefighters lift

3.9
safe area
(refuge area, fire protected lobby)
area, provided with a safe route to the lift and safe exit, e.g. stairs, that will remain safe for persons for the duration of firefighting operations and is both separated from a fire by suitable fire resisting construction and kept clear of smoke, in some countries known as a refuge or lobby

3.10
dual entry car
car with two car doors

3.11
Building Management System
BMS
system capable of making intelligent decisions based on information sent to it

3.12
lift environment
fire protected environment providing protected access from the usage area of the building to the firefighters lift

4 List of significant hazards

4.1 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 risk.

4.2 Significant hazards dealt with in this document are shown in Tables 1 and 2 below:

Table 1 — List of significant hazards and hazardous situations - Environment

Significant Hazards and Hazardous situations - Environment		Information in this document
1	Fire / heat / smoke may spread in to a lift well / machinery space / safe area	1.2 / 5.1
2	Exposed or obstructed lift equipment	1.2 / 1.4 / 5.1
3	Lift not useable long enough for firefighters	1.2 / 1.4 / 5.1 / 5.7
4	> 2 min delay of firefighting operations	Introduction / 1.2 / 5.1 / 5.7
5	Flow of water into the lift well	Introduction / 1.2 / 1.6 / 5.1.2 / 5.3 / 5.11.1 / Annex E
6	Entrapment on safe area due to a lift failure	1.2 / 1.4
7	Unsafe Environment for firefighters	1.2 / 1.4
8	Structure collapse before the firefighters have finished with the lift	1.4
9	Not having enough or correctly located firefighters lift to move the firefighters and their equipment through the building.	1.6

Table 2 — List of significant hazards and hazardous situations – Firefighters lift

No	Hazards as listed in EN ISO 12100:2010, Annex B	Requirements and clauses in this document
8	General hazards for lifts	5.1 / 5.2.1 / 5.8.3 / 5.8.4 / 5.9.1
1	Trapping hazard	5.2.2 / 5.4 / 5.6 / 5.7 / 5.8 / 5.9 / 5.10 / 5.11 / 5.12
8	> 2 min delay of firefighting operations	5.2.3 / 5.2.4 / 5.6 / 5.8 / 5.9 / 5.10 / 5.11 / 5.12.3 / 6 / 7
10	Combination of hazards	5.8.7 / 5.8.8 / 5.8.9
9	Failure or malfunction of the lift	5.3 / 5.4 / 5.7 / 5.8.5 / 5.11.1 / 5.11.2 / 5.12.3
8	Human error, human behaviour	5.12
8	Inadequate design, location or identification of manual controls	5.8.1 / 5.8.2 / 5.11.3
8	Inadequate marking	5.11.4
9	Failure of the power supply	5.9.1 / 5.9.2 / 5.10

5 Safety requirements and/or protective measures

5.1 Environment/building requirements

5.1.1 The firefighters lift is located in a well with a safe area in front of every landing door which is used for firefighting operations. In front of every landing door a safe area, a fire shutter or a fire door shall be provided.

NOTE The purpose of safe areas is to protect the lift well, firefighters and those who may be waiting to be evacuated against fire, heat and smoke and in addition to allow the self rescue as described in 5.4. The minimum dimensions of each safe area are given by national regulations.

5.1.2 It is the responsibility of national/local regulations to determine the required levels of fire resistance, and other building requirements that shall be addressed for a safe firefighters lift:

— protection of the areas in front of the landing doors;

— separation of the well;

— fire resistance of the landing doors;

— fire resistance of the lift well and machinery space walls;

— fire resistance of fire shutters and fire doors;

— connection between lift safe areas and staircase;

— water management; see Annex E;

— power supply;

— communication connection;

— smoke control e.g. air pressurization system or ventilation;

— number and size of firefighters lifts.

5.1.3 The level of fire resistance of the lift well shall also apply to any of the following: the walls and doors of safe areas, fire doors, fire shutters, doors to machinery spaces, pulley and machine rooms. If there are other lifts in the same well, then the entire common well shall fulfil the fire resistance requirements of firefighters lift wells. See Annex B. It is not necessary that other lifts shall remain in operation but it shall be ensured that a malfunction of another lift does not have any adverse influence of the function of the firefighters lift.

5.1.4 Any lift landing door which is not intended to be used by firefighters and which does not have a safe area shall be protected by a fire shutter or a fire door classified in line with the lift well structure and national regulations (see Figure B.3).

5.1.5 The firefighters lift shall have a secondary power supply available.

5.1.6 The firefighters lift electrical power supply cable(s) shall be fire protected.

5.1.7 The source of the secondary power supply and automatic switch gear shall be located in a fire protected area.

5.1.8 In the case of an air pressurized well, the following points shall be considered by those designing the pressurization system:

— air speed into the well is minimized to avoid excessive swaying of travelling cable or compensation means;

— when the lift is in phase 2 (see 5.8.8) A-weighted sound pressure level from the pressurization system is less than 80 dB(A) at positions 0,5 m from the microphones in the car, at the fire service access level and at the emergency and test panel;

— the pressurization shall not affect the opening and closing of the car and landing doors.

It is assumed that air pressurizing of the well does not cause any negative impacts on normal operation or safe maintenance activities of the lifts.

5.2 Fundamental firefighters lift requirements

5.2.1 The firefighters lift shall be designed in conformity with EN 81-20:2020 and provided with additional protection, controls and signals.

5.2.2 The size of the firefighters lift shall be in accordance with national regulations and preferably be selected from ISO 8100-30:2019. At no time shall the size be less than 1 100 mm wide by 1 400 mm deep with a rated load of 630 kg. See also Introduction.

The clear entrance width to the car shall be a minimum of 800 mm.

5.2.3 Where the intended use of the firefighters lift is to include evacuation, to accommodate such items as a stretcher or bed, then the minimum rated load shall be 1 000 kg and the minimum dimensions of the car 1 100 mm wide by 2 100 mm deep. See also Introduction.

NOTE For firefighters lifts national regulations can impose greater dimensions and rated loads.

5.2.4 The firefighters lift shall be able to reach the highest landing to be served in firefighting operations from the fire service access level within 60 s, from after the closing of the lift doors. However, for lifts with higher travel than 200 m, this time to reach the highest landing may be increased by 1 s for each 3 m additional travel height.

NOTE Experience has shown that a rated speed greater than 4,5 m/s can cause problems due to technical complexity, e.g. size of secondary power supply, turbulence from the pressurized environment and spoilers on the car roof.

5.2.5 The lift shall be designed to operate correctly during firefighting operations for a period equal to that required for the structure, e.g. 2 h, according to the following conditions:

a) electrical/electronic devices on landings, other than at the fire service access level, shall be designed to function correctly in an ambient temperature range of 0 °C to 65 °C or be made non-operational. A malfunction of devices (landing indicators and push buttons) shall not prevent operation of the lift under fire fighting conditions;

b) all other electrical/electronic components of the firefighters lift shall be designed to function correctly in an ambient temperature range of 0 °C to + 40 °C;

c) the correct functioning of the lift control shall be ensured in smoke filled wells and/or machinery spaces;

d) any ambient temperature sensor shall not stop, or prevent the start, of the firefighters lift.