SLOVENSKI STANDARD

SIST EN 81-2:1999/A2:2005

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Varnostna pravila za konstruiranje in vgradnjo dvigal (liftov) - 2. del: Hidravliļ na dvigala - A2: Prostori za pogon in vrvenice

Safety rules for the construction and installation of lifts - Part 2: Hydraulic lifts - A2: Machinery and pulley spaces

Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen - Teil 2: Hydraulisch betriebene Personen- und Lastenaufzüge - A2: Aufstellungsorte von Triebwerk und Steuerung sowie Seilrollen

Regles de sécurité pour la construction et l'installation des ascenseurs - Partie 2 : Ascenseurs hydrauliques - A2 :Emplacements de machinerie et de poulies

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91.140.90 Dvigala. Tekoļ e stopnice Lifts. Escalators

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EUROPEAN STANDARD

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English version

Safety rules for the construction and installation of lifts - Part 2: Hydraulic lifts - A2: Machinery and pulley spaces

Règles de sécurité pour la construction et l'installation des ascenseurs - Partie 2: Ascenseurs hydrauliques - A2: Emplacements de machinerie et des poulies

Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen und Kleingüteraufzüge - Teil 2: Hydraulisch betriebene Personen- und Lastenaufzüge - A2: Aufstellungsorte von Triebwerk und Steuerung sowie Seilrollen

This amendment A2 modifies the European Standard EN 81-2:1998; it was approved by CEN on 22 April 2004.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This amendment 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 Central Secretariat has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
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Contents

Foreword

This document (EN 81-2:1998/A2:2004) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, the secretariat of which is held by AFNOR.

This Amendment to the European Standard EN 81-2:1998 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2005, and conflicting national standards shall be withdrawn at the latest by April 2005.

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.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

EN 81-2:1998 requires special machine and pulley rooms. Modern technology shows that machines and associated parts can be located in the well, on the car or in cabinets. To ensure the safety of normal operation, maintenance and inspection provisions are necessary which are not yet described in this standard.

This amendment covers the necessary additional precautions by replacing the relevant existing text of EN 81-2:1998 or adding new clauses as indicated.

0 Introduction

0.3.15 The text of this clause is replaced by the following:

To ensure the correct functioning of the equipment in the machinery space(s), i.e. taking into account the heat dissipated by the equipment, the ambient temperature in the machinery space(s) is assumed to be maintained between + 5 °C and + 40 °C.

0.3.18 The following clause is added:

Access ways to the working areas are adequately lit (see **0.2.5**).

0.3.19 The following clause is added:

Minimum passageways required by building regulations are not obstructed by the open door/trap of the lift and/or any protection means for working areas outside of the well, where fitted according to the maintenance instructions (see **0.2.5**).

0.3.20 The following clause is added:

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

3 Definitions

The following definitions are added:

machinery *(machinerie) (Triebwerk und Steuerung)*
equipment traditionally placed in the machine room: cabinet(s) for control and drive system, lift machine, main switch(es) and means for emergency operations

machinery space *(emplacement de machinerie) (Aufstellungsort von Triebwerk und Steuerung)*
space(s) inside or outside of the well where the machinery as a whole or in parts is placed

pulley space *(emplacement de poulies) (Aufstellungsort von Seilrollen)*
space(s) inside or outside of the well where pulleys are placed

5 Lift well

5.3.3 Strength of the ceiling

The text of this clause is replaced by the following:

Not withstanding the requirements of 6.3.2 and/or 6.7.1.1, in the case of hanging guide rails the suspension points shall be able to take at least the loads and forces according to G.5.1.

6 Machine and pulley rooms

The whole of clause 6 is replaced by the following:

6 Machinery and pulley spaces

6.1 General provisions

Machinery and pulleys shall be located in machinery and pulley spaces. These spaces and the associated working areas shall be accessible. Provisions shall be made to allow access to the spaces only to authorised persons (maintenance, inspection and rescue). The spaces and the associated working areas shall be suitably protected against environmental influences to be taken into consideration and provisions made for suitable areas for maintenance/inspection work and emergency operation. See 0.2.2, 0.2.5 and 0.3.3.

See Annex L.

If the machinery space is not adjacent to the well, the hydraulic piping and the electric wiring connecting the machine room with the lift well shall be installed in a duct or trough, specially reserved for this purpose (see 12.3.1.2).

6.2 Access

6.2.1 The access way adjacent to any door/trap giving access to machinery and pulley spaces shall be:

a) capable of being properly lit by a permanent electric light fixture(s);

b) easy to use in complete safety in all circumstances without necessitating entry into private premises.

6.2.2 A safe access for persons to machinery and pulley spaces shall be provided. For preference this should be effected entirely by way of stairs. If it is not possible to install stairs, ladders satisfying the following requirements shall be used:

a) the access to the machinery and pulley spaces shall not be situated more than 4 m above the level accessible by stairs;

b) ladders shall be fastened to the access in such a way that they cannot be removed;

c) ladders exceeding 1,50 m in height shall, when in position for access, form an angle between 65° and 75° to the horizontal and shall not be liable to slip or turn over;

d) the clear width of the ladder shall be at least 0,35 m, the depth of the steps shall not be less than 25 mm and in the case of vertical ladders the distance between the steps and the wall behind the ladder shall not be less than 0,15 m; the steps shall be designed for a load of 1500 N;

e) adjacent to the top end of the ladder there shall be at least one hand hold within easy reach;

f) around a ladder, within a horizontal distance of 1,50 m, the risk of falling by more than the height of the ladder shall be prevented.

6.3 Machinery in machine room

6.3.1 General provisions

When lift machines and their associated equipment are located in a machine room, it shall comprise solid walls, ceiling, floor and door and/or trap.

Machine rooms shall not be used for purposes other than lifts. They shall not contain ducts, cables or devices other than for the lift.

These rooms may, however, contain:

a) machines for service lifts or escalators;

b) equipment for air-conditioning or heating of these rooms, excluding steam heating and high pressure water heating;

c) fire detectors or extinguishers, with a high operating temperature, appropriate for the electrical equipment, stable over a period of time, and suitably protected against accidental impact.

6.3.2 Mechanical strength, floor surface

6.3.2.1 Machine rooms shall be so constructed to withstand the loads and forces to which they are intended to be subjected.

They shall be in durable material not favouring the creation of dust.

6.3.2.2 Room floors shall be of non-slip material, e.g. trowelled concrete or chequer plate.

6.3.3 Dimensions

6.3.3.1 The dimensions of machine rooms shall be sufficient to permit easy and safe working on equipment, especially the electrical equipment.

In particular there shall be provided at least a clear height of 2 m at working areas, and:

a) a clear horizontal area in front of the control panels and cabinets. This area is defined as follows:

1) depth, measured from the external surface of the enclosures, at least 0,70 m;

2) width, the greater of the following values: 0,50 m or the full width of the cabinet or panel;

b) a clear horizontal area of at least 0,50 m x 0,60 m for maintenance and inspection of moving parts at points where this is necessary and, if need be, manual emergency operation (12.9).

6.3.3.2 The clear height for movement shall not be less than 1,80 m.

The access ways to the clear spaces mentioned in 6.3.3.1 shall have a width of at least 0,50 m. This value may be reduced to 0,40 m where there are no moving parts.

This clear height for movement is taken to the underside of the structural roof beams and measured from the floor of the access area.

6.3.3.3 There shall be a clear vertical distance of at least 0,30 m above the rotating parts of the machine.

6.3.3.4 When the machine room floor comprises a number of levels differing by more than 0,50 m, stairways or steps and guardrails shall be provided.

6.3.3.5 When the floor of the machine rooms has any recesses greater than 0,50 m deep and less than 0,50 m wide, or any ducts, they shall be covered.

6.3.4 Doors and trap doors

6.3.4.1 Access doors shall have a minimum width of 0,60 m and a minimum height of 1,80 m. They shall not open towards the inside of the room.

6.3.4.2 Access trap doors for persons shall give a clear passage of at least 0,80 m x 0,80 m, and shall be counterbalanced.

All trap doors, when they are closed, shall be able to support two persons, each counting for 1000 N on an area of 0,20 m x 0,20 m at any position, without permanent deformation.

Trap doors shall not open downwards, unless they are linked to retractable ladders. Hinges, if any, shall be of a type which cannot be unhooked.

When a trap door is in the open position, precautions shall be taken to prevent the fall of persons (e.g. a guardrail).

6.3.4.3 Doors or trap doors shall be provided with a key operated lock, capable of being opened without a key from inside the room.

Trap doors used only for access of material may be locked from the inside only.

6.3.5 Other openings

The dimension of holes in the slab and room floor shall be reduced to a minimum for their purpose.

With the aim of removing the danger of objects falling through openings situated above the well, including those for electric cables, ferrules shall be used, which project at least 50 mm above the slab or finished floor.

6.3.6 Ventilation

The machine rooms shall be suitably ventilated. Should the well be ventilated through the machine room, this has to be taken into account. Stale air from other parts of the building shall not be extracted directly into the machine room. It shall be such that the motors, and equipment, as well as electric cables, etc., are protected as far as it is reasonably practicable from dust, harmful fumes and humidity.

6.3.7 Lighting and socket outlets

The machine room shall be provided with permanently installed electric lighting with an intensity of at least 200 lux at floor level. The supply for this lighting shall be in conformity with 13.6.1.

A switch placed inside close to the access point(s), at an appropriate height, shall control lighting of the room.

At least one socket outlet (13.6.2) shall be provided.

6.3.8 Handling of equipment

One or more metal supports or hooks with the indication of the safe working load (15.4.5), as appropriate, are provided in the machine room ceiling or on the beams, conveniently positioned to permit the hoisting of heavy equipment (see 0.2.5 and 0.3.14).

6.4 Machinery inside the well

6.4.1 General provisions

6.4.1.1 Machinery supports and working areas inside the well shall be so constructed to withstand the loads and forces to which they are intended to be subjected.

6.4.1.2 In the case of wells partially enclosed at the exterior of buildings the machinery shall be suitably protected against the environmental influences.

6.4.1.3 The clear height for moving inside the well from one working area to another one shall not be less than 1,80 m.

6.4.2 Dimensions of working areas inside the well

6.4.2.1 The dimensions of working areas at the machinery inside the well shall be sufficient to permit easy and safe working on equipment.

In particular there shall be provided at least a clear height of 2 m at working areas, and:

a) a clear horizontal working area of at least 0,50 m x 0,60 m for maintenance and inspection of parts at points where this is necessary;

b) a clear horizontal space in front of the control panels and cabinets, defined as follows:

1) depth, measured from the external surface of the enclosures, at least 0,70 m;

2) width, the greater of the following values: 0,50 m or the full width of the cabinet or panel.

6.4.2.2 There shall be a clear vertical distance of at least 0,30 m above unprotected rotating parts of the machine. If the distance is less than 0,30 m guarding shall be provided according to 9.4.1 a).

See also 5.7.1.1.

6.4.3 Working areas in the car or on the car roof

6.4.3.1 If maintenance/inspection work on the machinery is to be carried out from inside the car or from the car roof and if any kind of uncontrolled or unexpected car movement resulting from maintenance/inspection can be dangerous to persons, the following applies:

a) any dangerous movement of the car shall be prevented by a mechanical device;

b) all movement of the car shall be prevented by means of an electric safety device in conformity with 14.1.2 unless the mechanical device is in its inactive position;

c) when this mechanical device is in its active position, it shall be possible to carry out maintenance work and to leave the working area safely.

6.4.3.2 The necessary devices for emergency operation and for dynamic tests (such as safety gear tests, buffer tests, rupture valve tests, pressure tests, etc.) shall be arranged so that they can be carried out from outside of the well in accordance with 6.6.

6.4.3.3 If inspection door and/or traps are located in the walls of the car, they shall:

a) have sufficient dimensions to carry out the required work through the door/trap;

b) be as small as possible to avoid falling into the well;

c) not open towards the outside of the car;

d) be provided with a key-operated lock, capable of being reclosed and relocked without a key;

e) be provided with an electrical safety device in conformity with 14.1.2, checking the locked position;

f) be imperforate and satisfy the same requirements for mechanical strength as the walls of the car.

6.4.3.4 Where it is necessary to move the car from the inside with open inspection door/trap the following applies:

a) an inspection control station according to 14.2.1.3 shall be available near the inspection door/trap;

b) the inspection control station in the car shall render inoperative the electric safety device according to 6.4.3.3 e);

c) the inspection control station in the car shall be accessible only to authorised persons and so arranged that it is not possible to use it to drive the car when standing on the car roof, e.g. by placing it behind the inspection door/trap;

d) if the smaller dimension of the opening exceeds 0,20 m the clear horizontal distance between the outside edge of the opening in the car wall and equipment installed in the well in front of that opening shall be at least 0,30 m.

6.4.4 Working areas in the pit

6.4.4.1 Where machinery is to be maintained or inspected from the pit and if this work requires movement of the car, or is likely to result in uncontrolled or unexpected car movement, the following applies:

a) a permanently installed device shall be provided to mechanically stop the car with any load up to rated load and from any speed up to rated speed to create a free distance of at least 2 m between the floor of the working area and the lowest parts of the car, excluding those parts mentioned in 5.2.3.3 b) 1) and 2). The retardation of mechanical devices other than safety gears appropriate for the rated speed (9.8.2) shall not exceed that produced by the buffers (10.4)

b) mechanical device shall be able to maintain the car stopped;

c) mechanical device can be operated manually or automatically;

d) where it is necessary to move the car from the pit, an inspection control station according to 14.2.1.3 shall be available for use in the pit;

e) opening of any door by the use of a key providing access to the pit shall be checked by an electric safety device according to 14.1.2 which prevents all further movement of the lift. Movement shall only be possible under the requirements given in g) below;

f) all movement of the car shall be prevented by means of an electric safety device in conformity with 14.1.2 unless the mechanical device is in its inactive position;

g) when the mechanical device is in its active position as checked by means of an electrical safety device in conformity with 14.1.2, electrically driven movement of the car shall only be possible from the inspection control station(s);

h) return of the lift to normal service shall only be made by operation of an electrical reset device placed outside of the well and accessible to authorised persons only, e. g. inside a locked cabinet.