SLOVENSKI STANDARD
SIST EN 1808:2015

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Nadomešča:
SIST EN 1808:2000+A1:2010

Varnostne zahteve za visečo opremo, namenjeno dostopu - Konstrukcijski izračuni, kriteriji stabilnosti, izvedbe - Pregledi in preskusi

Safety requirements for suspended access equipment - Design calculations, stability criteria, construction - Examinations and tests

Sicherheitsanforderungen an hängende Personenaufnahmemittel - Berechnung, Standsicherheit und Bau - Prüfungen

Exigences de sécurité des plates-formes suspendues à niveau variable - Calculs, stabilité, construction - Essais

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English Version

Safety requirements for suspended access equipment - Design calculations, stability criteria, construction - Examinations and tests

Exigences de sécurité des plates-formes suspendues à niveau variable - Calculs, stabilité, construction - Examen et essais

Sicherheitsanforderungen an hängende Personenaufnahmemittel - Berechnung, Standsicherheit, Bau - Prüfungen

This European Standard was approved by CEN on 10 February 2015.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 1808:2015) has been prepared by Technical Committee CEN/TC 98 “Lifting platforms”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by October 2015 and conflicting national standards shall be withdrawn at the latest by October 2015.

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

This document supersedes EN 1808:1999+A1:2010.

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.

This document also includes information that building designers, structural engineers and contractors need to consider before specific suspended access equipment (SAE) manufacturers/suppliers are appointed.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards are covered are indicated in the scope of this standard.

It is assumed that:

a) discussions take place between the manufacturer/supplier and purchaser/hirer about specific local installation conditions and expected duty;

b) a risk analysis for each component that might be incorporated into a complete SAE installation has been made and rules have been drawn up;

c) the safety requirements of this standard have been drawn up on the basis that the components are:

   1) designed in accordance with good engineering practice and calculation codes, including all failure modes;

   2) of sound mechanical and electrical construction;

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

   4) free of visible defects;

d) harmful materials such as asbestos are not used;

e) the equipment is maintained in good working order;

f) any mechanical device manufactured in accordance with good practice and the requirements of this standard shall not be allowed to deteriorate to the point of creating a hazard without being detected;

g) the working ambient temperature range is between –10 °C and +55 °C;

h) the structure on which the SAE is installed is of adequate strength to resist the expected imposed loads.

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 machines that have been designed and built in accordance with the provisions of this type C standard.

1 Scope

1.1 Application

This European Standard specifies the requirements, test methods, marking and information to be provided by the manufacturer/supplier for suspended access equipment (SAE).

It is applicable to both permanent and temporary equipment which can be powered or hand operated and which are defined in Clause 3.

The requirements of this standard include the rails, tracks and other support systems on which SAE depend for their integrity and safety as well as taking into account all associated loads and fixings to the building structure.

This document is not applicable to SAE which is manufactured before the date of its publication as an EN.

1.2 Hazards

This European Standard deals with significant hazards pertinent to SAE when they are used as intended and under the conditions foreseen by the manufacturer (see Clause 4). This European Standard specifies appropriate technical measures to eliminate or reduce risks arising from the significant hazards.

1.3 Exclusions

The following are not covered in this document:

a) operation in severe and special conditions (e.g. extreme environmental conditions, corrosive environments, strong magnetic fields);

b) operation subject to special rules (e.g. potentially explosive atmospheres, work on live overhead electrical lines);

c) transportation of passengers from one level to another;

d) handling of loads which could lead to a dangerous situation (e.g. molten metal, acids/bases, radioactive materials);

e) working platforms suspended by cranes;

f) silo access equipment;

g) SAE using chains for the direct suspension of a platform;

h) SAE using fibre ropes for the suspension of a platform;

i) SAE intended to be used underground;

j) SAE intended to be used in shafts;

k) SAE directly powered by combustion engines.

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 795, *Personal fall protection equipment — Anchor devices*

EN 1993 (all parts), *Eurocode 3: Design of steel structures*

EN 1999 (all parts), *Eurocode 9: Design of aluminium structures*

EN 60204-1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1)*

EN 60204-32:2008, *Safety of machinery — Electrical equipment of machines — Part 32: Requirements for hoisting machines (IEC 60204-32:2008)*

EN 60529, *Degrees of protection provided by enclosures (IP-code) (IEC 60529)*

EN ISO 4413, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413)*

EN ISO 4414, *Pneumatic fluid power — General rules and safety requirements for systems and their components (ISO 4414)*

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

EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13849-2:2012, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation (ISO 13849-2:2012)*

EN ISO 13850, *Safety of machinery — Emergency stop — Principles for design (ISO 13850)*

3 Terms and definitions, symbols and abbreviations

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply. They are classified in terms of key words.

3.1
building maintenance unit
BMU
SAE that are permanently installed on and dedicated to a specific building or structure and intended to be used for planned routine inspection, cleaning and maintenance of the particular building and where the general public might have access below the suspended platform when in operation

Note 1 to entry: BMUs may consist of a platform suspended from a suspension rig that is generally a trolley unit with hoist(s) operating either on a rail track or on a suitable running surface (e.g. concrete track).

Note 2 to entry: Monorails with traversing trolleys or other suspension rigs (e.g. davits) fixed to a building and from which a platform may be suspended should be considered as parts of a BMU and should only be used in conjunction with suspended platforms conforming to the requirements of this standard.

3.2
temporary suspended access equipment
TSAE
SAE systems that are temporarily installed on a building or structure in order to carry out specific construction tasks on a work site

EXAMPLE Work sites include cladding installation, painting, maintenance, repair and refurbishment of buildings, bridges, chimneys and other structures.

Note 1 to entry: TSAE may consist of a platform (TSP) and a suspension rig that are assembled at site prior to carrying out the task. TSAE are then dismantled and removed from site on completion of the work for which they were installed and may be reused elsewhere.

Note 2 to entry: Where a TSP is attached to a permanently installed suspension rig (e.g. roof trolley or monorail system) such installations are considered to be hybrid systems and the appropriate clauses of this document apply (see 12.6).

3.3
personnel

3.3.1
competent person
designated person, suitably trained, qualified by knowledge and practical experience and provided with the necessary instructions to carry out specified tasks safely

3.3.2
operator
designated person, suitably trained for working at height, qualified by knowledge and practical experience and provided with the necessary information to carry out operations safely from SAE

3.4
hoists and accessories

3.4.1
drum hoist
hoist with a drum on which the suspension ropes are reeled in one or more layers

3.4.2
traction hoist
assembly through which a wire rope is conveyed as a result of friction between the wire rope and the traction assembly with no tail load

3.4.3
twin capstan drum hoist
hoist system which lifts and lowers suspension rope(s) by passing the rope(s) around two gear driven grooved multi-wrap capstan drums and then to a wire rope winder designed to apply a tail load to the capstan drive system

3.4.4
jaw operated traction hoist
hoist where the traction assembly consists of two pairs of jaws

3.4.5
prime mover
source of power for the hoist

EXAMPLE This includes electric, hydraulic, pneumatic motors and hydraulic jacks.

3.4.6
rated speed
average speed measured during the upward and downward hoisting travel of a platform carrying its rated load for a travel length of 10 m or more and with the rated power supply applied

3.4.7
service brake
mechanical brake automatically applied by stored energy until released by an external sustained force, usually applied electrically, hydraulically or pneumatically, either under the control of the operator or automatically

EXAMPLE An example of stored energy is spring force.

3.4.8
secondary device
device intended to stop the descent of a platform under emergency conditions

EXAMPLE For example, breaking of a suspension wire rope or failure of a hoist.

3.4.8.1
fall arrest device
device acting directly on a secondary wire rope and which automatically stops and holds a platform in a fixed position

3.4.8.2
secondary brake
brake acting directly on a drum, traction sheave or final drive shaft and intended to stop the descent of a platform

3.4.9
anti-tilt device
device that detects when the longitudinal slope of a platform exceeds a pre-set angle

3.4.10
no-power descent
manually operated system that allows controlled descent of a power operated platform

3.4.11
manual lever/wheel/handle
device on the hoist that allows a platform to be lifted or lowered manually

3.4.12
wire (rope) winder
storage drum on to which a wire rope is reeled

3.4.13
cable reeler
storage drum on to which an electric cable is reeled

3.4.14
hoist operation cycle (for test purposes only)
one cycle that consists of lifting and lowering over a minimum vertical distance, this distance being where either

— the wire rope passes through all wire rope related parts of a traction hoist, its pulleys and reeler system, or

— the wire rope passes four turns around a drum hoist and its closely related pulleys

3.4.15
platform-mounted hoist
hoist that is mounted on a platform to raise and lower the suspended platform

3.4.16
roof-mounted hoist
hoist that is mounted on a suspension rig or trolley to raise and lower a suspended platform

3.4.17
materials (auxiliary) hoist
hoist that is mounted on a suspension rig or trolley to raise and lower other materials independently of a platform

3.4.18
overload detection device
device that trips and acts automatically to stop the upward motion of a platform if the load in the suspension wire ropes exceeds the tripping limit

3.4.19
tripping limit
static load that causes the overload detection device to operate

3.5
suspended platforms

3.5.1
suspended platform
that portion of SAE assembly designed to carry persons and their equipment

3.5.1.1
single point suspended platform
platform incorporating only one connection point

3.5.1.2
double point suspended platform
platform incorporating two connection points

3.5.1.3
multi-point suspended platform
platform incorporating three or more connection points and which is not hinged

3.5.1.4
hinged continuous platform
long platform incorporating more than two connection points and having articulated sections to ensure the correct tension is maintained in each suspension wire rope

3.5.1.5
multi-deck suspended platform
platform made up of two or more decks connected vertically

Note 1 to entry: See Figure 17.

3.5.1.6
cantilevered platform
platform where the deck extends beyond a connection point

3.5.1.7
suspended chair
chair that incorporates one connection point for one person only to use

3.5.2
restraint system
system connecting a suspended platform to mullions or fixed points on a building and which limits, whilst in use, the lateral movement of the suspended platform due to the wind

3.5.3
suspension wire rope restraint system
vertical series of attachment points on a building to which lanyards are connected to guide the suspension ropes of a suspended platform on descent and disconnected on ascent

Note 1 to entry: See Figure 18.

3.5.4
connection point
point provided on the platform or chair for the attachment of the hoist rope(s) or fall arrest device(s)

3.5.5
natural ground level
level from which the requirement for a platform restraint system is determined

3.6
loads

3.6.1
total suspended load
TSL
static load imposed on the suspension point(s) of a suspension rig comprising the rated load of the platform, the self-weight of the platform, the ancillary equipment, the wire ropes and the electric cable, if any

3.6.2
rated load
RL
rated load of persons and equipment that a suspended platform has been designated to carry by the manufacturer

3.6.3
working load limit
WLL
maximum load that a piece of equipment is authorized to sustain as designated by the manufacturer

3.6.4
hoist working load limit
HWLL
working load limit of a material hoist

3.6.5
working coefficient
arithmetic ratio between the maximum load designated by the manufacturer that a piece of equipment or SAE is able to hold and the WLL marked on the piece of equipment or SAE

3.6.6
test coefficient
arithmetic ratio between the loads used to carry out static or dynamic tests on a piece of equipment or SAE and the WLL marked on the piece of equipment or SAE

3.6.7
static test
test during which a piece of equipment or SAE is first inspected and then subjected to a force corresponding to the WLL multiplied by the appropriate static test coefficient and then re-inspected once the test load has been released to ensure that no damage has occurred

3.6.8
dynamic test
test during which the SAE is operated in all its possible configurations at its WLL, with account being taken of the dynamic behaviour of the SAE, in order to check that the SAE and its safety features are functioning correctly

3.6.9
hoisting cycle
sequence commencing when a platform is hoisted from the ground (or from the roof) and ending when the platform is returned to the starting position

3.7
steel wire ropes

3.7.1
calculated coefficient
ratio between the designated minimum breaking load of a steel wire rope and the maximum static load applied to that rope

3.7.2
minimum breaking load (of steel wire rope)
minimum breaking load of a steel wire rope as designated by the manufacturer

3.7.3
suspension rope
active steel wire rope carrying the suspended load

3.7.4
secondary rope
steel wire rope not normally carrying the suspended load but rigged to work in conjunction with a fall-arrest device

3.7.5
single active rope suspension system
two steel wire ropes attached to a suspension point, one rope being the suspension rope and the other being the secondary rope

3.7.6
double active rope suspension system
two steel wire ropes attached to one suspension point and sharing the suspended load

3.8
suspension rigs and track systems

3.8.1
suspension rig
portion of the SAE from which a platform is suspended

Note 1 to entry: This excludes the track system.

3.8.2
trolley
suspension rig mounted on wheels and designed to run on a track, runway or monorail to support a suspended platform

3.8.3
suspension point
designated position provided on a suspension rig assembly for the independent anchorage of the ropes, diverter pulleys or hoists

3.8.4
pivot point
device provided to equalize the loading imposed by the two suspension ropes of a double active rope suspension system

3.8.5
fulcrum
point or line about which the balancing moments of a suspension rig are calculated

3.8.6
stability coefficient
coefficient by which the overturning moment is multiplied

3.8.7
inboard portion
portion of a suspension rig that is on the building side of the fulcrum

3.8.8
outboard portion
portion of a suspension rig which projects from the fulcrum over the edge of a building

3.8.9
counterweights
weights that are attached to a suspension rig to counterbalance the overturning moments

3.8.10
counterweighted suspension beam
static beam where the stability is assured by counterweights

3.8.11
mechanically anchored suspension rig
suspension rig where stability is assured by mechanical anchors fixed to the building structure

3.8.12
stationary suspension rig
structure that is assembled and positioned before a platform is suspended from it

3.8.13
parapet clamp
structure attached to a roof parapet or similar static structure and dependent on the parapet for location and anchorage

Note 1 to entry: See Figure 13.

3.8.14
davit
structure fixed to a roof or similar static structure

Note 1 to entry: See Figure 12.

3.8.15
rail track
rails generally installed at roof level to support and guide a mobile suspension rig (trolley unit)

3.8.16
rail track support
braced or unbraced stanchion or cantilever supporting a rail track

3.8.17
sleeper
beam lying flat on a roof to support a rail track

Note 1 to entry: A sleeper is typically made of concrete or steel.

3.8.18
guide rail
rail generally installed at roof level to guide a mobile suspension rig (trolley unit)

3.8.19
monorail track
track generally fixed along the perimeter of a building to support and guide a mobile suspension rig (trolley unit)

3.8.20
lifting
operation that moves a suspended platform to a higher level

3.8.21
lowering
operation that moves a suspended platform to a lower level

3.8.22
platform rotation
circular horizontal movement of a suspended platform about a vertical axis passing through the platform itself

3.8.23
suspension rig slewing
circular horizontal movement of a suspension rig about a vertical axis

3.8.24
traversing
longitudinal horizontal movement of a suspension rig

3.8.25
luffing
rotational upward/downward movement of jib(s) about a horizontal axis to allow positioning of a suspended platform

3.8.26
jib telescoping
movement to extend or retract a jib to allow positioning of a suspended platform

3.8.27
jib slewing
circular movement of jib(s) about a vertical axis to allow positioning of a suspended platform

3.8.28
LW
vertical distance from the track to the centre of the area of the suspension rig affected by wind