



SLOVENSKI STANDARD

SIST EN 1808:2000

01-april-2000

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Safety requirements on Suspended Access Equipment - Design calculations, stability
criteria, construction - Tests

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

Exigences de sécurité aux Plates-formes suspendues a niveaux variables - Calculs,
stabilité, construction - Essais

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Ta slovenski standard je istoveten z: EN 1808:1999

ICS:

53.020.99	Druga dvigalna oprema	Other lifting equipment
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en

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English version

Safety requirements on Suspended Access Equipment - Design calculations, Stability criteria, Construction - Tests

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This European Standard was approved by CEN on 19 February 1999.

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

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by September 1999, and conflicting national standards shall be withdrawn at the latest by September 1999.

This European Standard 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 standard.

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

0 Introduction

This European standard is a type C standard as stated in EN 292.

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

It is assumed that:

- Negotiations shall take place between manufacturer and user about specific local installation conditions;

- Risk analysis of each component that may be incorporated in a complete SAE installation has been made. Rules have been drawn up on the basis of this assumption;

- The safety requirements of this standard have been drawn up on the basis that the components are

- a) designed in accordance with the usual engineering practice and calculation codes, including all failure modes,
- b) of sound mechanical and electrical construction,
- c) made of materials with adequate strength and of suitable quality, and
- d) be free of defects;

- Harmful materials, such as asbestos are not used;
- The equipment is kept in good working order;
- Any mechanical device manufactured according to good practice and the requirements of this standard shall not deteriorate to the point of creating a hazard without being detected.
- The ambient temperature range is between -10° C and +55° C. Additional requirements for equipment intended for use outside the ambient temperature range are set out in annex D.
- The parapets and roofs are of adequate strength for the SAE equipment to be installed.

1 Scope

1.1 Application

This standard specifies the safety requirements for Suspended Access Equipment (SAE).

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

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.

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1.3 Exclusions

The following are not covered: ^{SIST EN 1808:2000}
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- a) operation in severe conditions (e.g. extreme environmental conditions, corrosive environment, strong magnetic fields, etc.);
- b) operation subject to special rules (e.g. potentially explosive atmospheres, work on live lines);
- c) transportation of passengers from one level to another;
- d) handling of loads, the nature of which could lead to dangerous situations (e.g. molten metal, acids/bases, radioactive materials, brittle loads);

- e) hazards occurring when handling suspended loads in conjunction with the suspended platform;
- f) hazards occurring when used on public roads, over water, or wherever it is not possible to lower the platform to a safe position;
- g) hazards arising from wind pressure acting on loads having a surface area in excess of 2 m²;
- h) SAE using cableless control systems.

The following applications for SAE are excluded from this standard:

- Access to working areas with an incline in excess of 45° compared to the vertical;
- Working platforms suspended by cranes;
- Silo access equipment;
- Access equipment using fibre ropes or chains for the suspension of the platform;
- SAE intended to be used underground;
- SAE powered by combustion engines;
- SAE intended to be used in shafts.

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Normative references

- EN 292-1: 1991** Safety of machinery - Basic concepts, general principles for design
Part 1: Basic terminology, methodology
- EN 292-2: 1991** Safety of machinery - Basic concepts, general principles for design
Part 2: Technical principles and specifications
- EN 294: 1992** Safety of machinery - Safety distances to prevent danger zones being reached by the upper limbs
- EN 418: 1992** Emergency stop equipment, functional aspects. Principles for design

EN 614-1: 1995	Safety of machinery - Ergonomic design principles Part 1: Terminology and general principles
EN 954-1: 1996	Safety of machinery-Safety-related parts of control systems Part 1: General principles for design
EN 982: 1996	Safety requirements for fluid power systems and their components - Hydraulics
EN 983: 1996	Safety requirements for fluid power systems and their components - Pneumatics
EN 60204-1: 1992	Safety of machinery - Electrical equipment of machines Part 1: General requirements
EN 60529: 1991	Degrees of protection provided by enclosures (IP-code) (IEC 60529:1989)
EN 60947-5-1: 1991	Low-voltage switchgear and controlgear; Part 5: Control circuit devices and switching elements. Section 1: Electromechanical control circuit devices and switching elements
prEN 280: 1998	Mobile elevating work platforms - Design calculations, stability criteria, construction - Safety, examinations and tests
EN 1050: 1996	Safety of machinery-Risk assessment

3 Definitions

For the purpose of this standard, the following definitions apply. They are classified in terms of key words.

3.1 Building Maintenance Unit (BMU).

BMUs are SAE intended to be permanently installed and dedicated to a specific building or structure. BMUs consist of a platform, suspended from a suspension rig which is generally a trolley unit with hoist operating either on rails or on a suitable surface, e.g. concrete track. Monorails with traversing trolleys or other suspension rigs, e.g. davits, fixed to the building, from which a platform may be suspended, shall be considered as parts of a BMU.

NOTE: BMU are intended to be used by operators for inspection, cleaning and maintenance of a building where the general public may have access below the suspended platform.

3.2 Temporary suspended platforms (TSP)

TSPs are SAE which are temporarily installed on a building or structure for specific tasks. TSPs consist of a platform and suspension rig which are assembled prior to use on a work site. They are dismantled and removed from site on completion of the work for which they were installed.

NOTE: TSPs are intended to be used by operators for, e.g. construction, cladding, painting, maintenance and refurbishment of buildings, bridges, chimneys and other structures.

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 enable the required task to be carried out safely.

3.3.2 Operator

Designated person, suitably trained for working at height, qualified by knowledge and practical experience and provided with the necessary instructions to enable operations to be carried out on SAE.

3.4 Hoist

3.4.1 Drum hoist

Hoist with a drum onto which the suspension ropes are reeled in one or more layers.

3.4.2 Traction hoist

Assembly through which the 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 the suspension rope by passing the rope around two gear driven grooved multiwrap capstan drums, and transferred to a wire rope winder designed to apply a "tail load" to the capstan drum 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, e.g. electric, hydraulic, pneumatic motors and hydraulic jack.

3.4.6 Rated speed

Average speed measured during the upward and downward hoisting travel of the platform with 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 (e.g. spring force) until released with an external sustained power supply (electrically, hydraulically, pneumatically, etc.) under the control of the operator or automatically.

3.4.8 Secondary device

Device intended to stop the descent of the platform under emergency conditions, e.g. 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, which automatically stops and holds the platform.

3.4.8.2 Secondary brake: Brake acting directly on the drum, traction sheave, or final drive shaft, intended to stop the descent of the platform.

3.4.9 Anti-tilt device

Device which detects when the longitudinal slope of the 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 which allows the platform to be lifted or lowered manually.

3.4.12 Wire rope winder

Storage drum onto which wire rope is reeled.

3.4.13 Cable reeler

Storage drum onto which electric cable is reeled.

3.4.14 Hoist operation cycle (for test purposes only)

One cycle shall consist 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 the traction hoist and its pulleys and reeler system, or
- the wire rope passes through four turns around the drum hoist and its related pulleys.

3.4.15 Platform-mounted hoist

Hoist which is mounted on the platform.

3.4.16 Roof-mounted hoist

Hoist which is mounted on the suspension rig or trolley.

3.4.17 Overload detection device

Device which trips and acts automatically to stop the upward motion of a platform if the load in the suspension wire rope(s) reach(es) the tripping limit.

3.4.18 Tripping limit

Static load which causes the overload detection device to operate.

3.5 Suspended platforms

3.5.1 Suspended platform

That portion of the assembly designed to carry persons and their equipment.

3.5.1.1 Single point suspended platform: Platform which incorporates 1 anchor point.

3.5.1.2 Double point suspended platform: Platform which incorporates 2 anchor points.

3.5.1.3 Multi-point suspended platform: Platform which incorporates 3 or more anchor points and which is not hinged.

3.5.1.4 Hinged continuous platform: Long platform which incorporates more than 2 anchor points having articulated sections to ensure tension in each suspension wire rope.

3.5.1.5 Multi-deck suspended platform: Platform made up of 2 or more decks, connected vertically (See Figure 17).

3.5.1.6 Suspended chair: Chair which incorporates one anchor point, for one person to use.

3.5.1.7 Cantilevered platform: Platform where the deck extends beyond the anchor point.

3.5.2 Restraint system

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System attaching the suspended platform to the mullions or other fixtures on the building and which limits the lateral movement of the suspended platform due to the wind.

3.5.3 Suspension wire rope restraint system

Vertical series of plugs on the building, each with a lanyard and end ring which is fitted to the suspension ropes on descent and removed on lifting (See Figure 19).

3.5.4 Anchor point

Point provided on the platform or chair for the independent attachment of the hoist(s)/suspension rope(s) and secondary rope(s)/fall arrest device(s).

3.6 Loads

3.6.1 Total suspended load (TSL)

Static force imposed on the suspension point(s), consisting of 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)

Maximum mass which the suspended platform has been designed to carry as designed by the manufacturer. The rated load comprises persons and equipment.

3.6.3 Working load limit (WLL)

Maximum load which a piece of equipment is authorised to sustain as designed by the manufacturer. The WLL is specified by the manufacturer.

3.6.4 Working coefficient

Arithmetic ratio between the load guaranteed by the manufacturer up to which a piece of equipment or the SAE, is able to hold it and the WLL marked on a piece of equipment or SAE.

3.6.5 Test coefficient

Arithmetic ratio between the load used to carry out the static or dynamic tests on a SAE or a piece of equipment, and the WLL marked on the SAE or a piece of equipment.

3.6.6 Static test

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

3.6.7 Dynamic test

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

3.7 Steel wire ropes

3.7.1 Calculated coefficient

Ratio between the guaranteed breaking load of a steel wire rope and the maximum static force that shall be applied to that rope.

- 3.7.2 Guaranteed breaking load**
Breaking load of a steel wire rope guaranteed 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 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 rope being the secondary rope.
- 3.7.6 Double active rope suspension system**
Two steel wire ropes attached to a suspension point and each carrying part of the suspended load.
- 3.8 Suspension rig**
- 3.8.1 Suspension rig**
That portion of the equipment from which the platform is suspended (excluding the track system).
- 3.8.2 Trolley unit**
Suspension rig mounted on wheels which is capable of traversing.
- 3.8.3 Suspension point**
Designated area provided on the suspension rig assembly for the independent attachment of the suspension and secondary wire ropes, diverter pulleys or hoists.
- 3.8.4 Fulcrum**
Pivoting point or line about which the balancing moments of the suspension rig are calculated.
- 3.8.5 Stability coefficient**
Coefficient by which the overturning moment is multiplied.
- 3.8.6 Inboard portion**
That portion of the suspension rig which is on the building side of the fulcrum.
- 3.8.7 Outboard portion**
That portion of the suspension rig which projects from the fulcrum over the edge of the building.

- 3.8.8 Counterweights**
Weights which are attached to the suspension rig to counterbalance the overturning moment.
- 3.8.9 Counterweighted suspension beam**
Static beam where the stability is assured by counterweights.
- 3.8.10 Mechanically anchored suspension rig**
Structure where the stability is assured by a mechanical anchor.
- 3.8.11 Stationary suspension rig**
Structure which is positioned and fixed before suspending the platform.
- 3.8.12 Parapet clamp**
Structure attached to the roof parapet and dependent on the parapet for location and anchorage.
- 3.8.13 Davit**
Structure anchored to the roof (See Figure 12).
- 3.8.14 Rail track**
Rails normally installed at roof level to support and guide a trolley unit.
- 3.8.15 Guide rail**
Rail normally installed at roof level to guide a trolley unit.
- 3.8.16 Monorail track**
Track normally fixed along the perimeter of a building at roof level to support and guide a traversing trolley.
- 3.8.17 Traversing trolley**
Wheeled block designed to run on a monorail track, used to suspend a platform below the monorail and to incorporate a traversing system for the platform.
- 3.8.18 Lifting**
All operations which move a platform to a higher level.
- 3.8.19 Lowering**
All operations which move a platform to a lower level.
- 3.8.20 Platform rotation**
Circular movement of the platform about its vertical axis passing through the platform itself.
- 3.8.21 Suspension rig slewing**
Circular horizontal movement of the suspension rig about a vertical axis.

- 3.8.22 Traversing**
Longitudinal movement of a suspension rig .
- 3.8.23 Luffing**
Rotational movement of the jib(s) about a horizontal axis to allow positioning of the platform.
- 3.8.24 Jib telescoping**
Movement to extend or retract a jib.
- 3.8.25 Jib slewing**
Circular movement of the jib relative to the suspension rig.

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