SLOVENSKI STANDARD
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Osebna oprema za varovanje pred padci z višine - Vrvni dostopni sistemi - Naprave za nastavitev vrvi

Personal fall protection equipment - Rope access systems - Rope adjustment devices

Persönliche Absturzschutzausrüstung - Systeme für seilunterstütztes Arbeiten - Seileinstellvorrichtungen

Equipements de protection individuelle pour la prévention des chutes de hauteur - Systemes d'acces par corde - Dispositif de réglage de corde pour maintien au poste de travail

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Personal fall protection equipment - Rope access systems - Rope adjustment devices

Equipements de protection individuelle pour la prévention des chutes de hauteur - Systèmes d'accès par corde - Dispositif de réglage de corde pour maintien au poste de travail

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Foreword

This document (EN 12841:2006) has been prepared by Technical Committee CEN/TC 160 “Protection against falls from a height including working belts”, 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of an identical text or by endorsement, at the latest by February 2007, and conflicting national standards shall be withdrawn at the latest by February 2007.

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 89/686/EEC.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

In rope access systems, rope adjustment devices are used in combination with anchor lines, which could be a working line or a safety line, normally made of ropes conforming to type A of EN 1891. Rope adjustment devices are intended to be used to link sit harnesses (in accordance with EN 813) or full body harnesses (in accordance with EN 361) to a working line and a safety line to allow access, egress and changes in the work position, to give support and to protect against falls.

Attention is drawn to the limitations of rope adjustment devices. Type A rope adjustment devices are for use on safety lines to prevent a fall in the event of failure of the working line or its components. However in extreme circumstances, such as failure of the working line or its components during improper use of the system, type A rope adjustment devices may be called upon to prevent or arrest a limited fall. This is reflected in the test requirements. Type B and C rope adjustment devices are for ascending and descending a working line respectively, but also have a fall prevention function. The design of each type may be incorporated into another when, in every case, they should meet the higher requirements of any common or similar test.

In a rope access system, the worker should always be protected by a type A rope adjustment device connected to a safety line and a type B or C rope adjustment device connected to a working line. The two rope adjustment devices with their respective anchor line are all components of the protective system. It is fundamental for the safe use of a rope access system that the worker is always connected to both anchor lines, and that any slack in the anchor lines and connecting lanyards is avoided.

1 Scope

This European Standard applies to rope adjustment devices intended for use in rope access systems. It specifies the requirements, test methods, marking and information supplied by the manufacturer. Rope adjustment devices conforming to this European Standard may be designed for the use of one person, or in case of rescue, for two persons simultaneously. The rope adjustment devices as specified are not suitable for use in a fall arrest system.

2 Normative references

The following referenced documents are indispensable for the application 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 362, *Personal protective equipment against falls from a height — Connectors*

EN 364:1992, *Personal protective equipment against falls from a height — Test methods*

EN 365, *Personal protective equipment against falls from a height — General requirements for instructions for use, maintenance, periodic examination, repair, marking and packaging*

EN 892, *Mountaineering equipment — Dynamic mountaineering ropes — Safety requirements and test methods*

EN 1891, *Personal protective equipment for the prevention of falls from a height — Low stretch kernmantel ropes*

EN ISO 7500-1, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system (ISO 7500-1:2004)*

prEN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray test (ISO 9227:2006)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
adjustable anchor line
anchor line with a rope adjustment device connected to it

3.2
anchor line
flexible line connected at least at one end to an anchor to provide a means of support, restraint or other safeguard for a person

NOTE An anchor line may be a working line or a safety line.

3.3
anchor
secure part of construction or structure to which an anchor line is connected

3.4
arrest distance
arrest distance H_a in metres, which the type A rope adjustment device uses to take up the fall, as measured in the dynamic performance test

NOTE Dynamic performance test refers to 5.6.2.

3.5
braking force
maximum force F_{max} in kilonewtons, measured at the anchor during the braking period of the dynamic performance test

NOTE Dynamic performance test refers to 5.6.2.

3.6
component
part of a system at a point of sale by the manufacturer, supplied with packaging, marking and information supplied by the manufacturer

NOTE Harnesses and connectors are examples of components of a system.

3.7
attachment point
primary point of connection to the rope adjustment device, as described by the manufacturer

3.8
descent control element
integral element of the type C rope adjustment device, normally operated by hand, used to control the velocity of descent down the descent line

3.9
hands-free locking element
integral part or function of the descent control element of a type C rope adjustment device which completely stops the descent and thereby prevents an uncontrolled descent or a fall if the user fails to engage the rope adjustment device

3.10
panic-locking element
integral part or function of the descent control element of a type C rope adjustment device which completely stops the descent and thereby prevents an uncontrolled descent or a fall if the user panics and operates the rope adjustment device beyond its intended descent control parameters

3.11
personal fall protection system
assembly of components for protection against falls from a height at work when the risk of a fall exists, including at least a body holding device connected to a reliable anchor

NOTE Excludes systems for professional and private sports activities.

3.12
maximum rated load
maximum mass in kilograms of personnel, including tools and equipment, to be used with the rope adjustment device, as specified by the manufacturer

3.13
release prevention function
mechanism or method to prevent the rope adjustment device from accidentally releasing the anchor line

3.14
rope access system
personal fall protection system, which comprises two separately secured sub-systems, one as the working line and the other as the safety line, which are used for getting to and from the place of work, and which can be used for work positioning and rescue

3.15
rope adjustment device
component which, when fitted to an anchor line of appropriate diameter and type, will enable the user to vary his or her position along it

NOTE Rope adjustment devices are sub-divided into Types A, B and C. The same rope adjustment device may conform to more than one type.

3.16
Type A rope adjustment device: safety line adjustment device
rope adjustment device for a safety line which accompanies the user during changes of position and/or allows adjustment of the safety line, and which locks automatically to the safety line under static or dynamic loading

3.17
Type B rope adjustment device: working line ascender
manually operated rope adjustment device which, when attached to a working line, locks under load in one direction and slides freely in the opposite direction

NOTE Type B rope adjustment devices are intended always to be used in conjunction with a Type A rope adjustment device connected to a safety line.

3.18
Type C rope adjustment device: working line descender
manually operated, friction inducing rope adjustment device which allows the user to achieve a controlled downward motion and a stop, with hands off, anywhere on the working line

NOTE Type C rope adjustment devices are intended always to be used in conjunction with a Type A rope adjustment device connected to a safety line.

3.19
safety line
anchor line provided as a safeguard

3.20
working line
anchor line used primarily for support during access, egress and work positioning

3.21
work positioning
technique that enables a person to work supported in tension or suspension by personal protective equipment in such a way that a fall is prevented

NOTE Work positioning in a rope access system is a specific technique, and is not intended to conform to work positioning in accordance with EN 358.

4 Requirements

4.1 General

4.1.1 Anchor lines

Rope adjustment devices shall be tested in accordance with Clause 5. All the tests, with the exception of 5.4.7, shall be performed on two adjustable anchor lines, one to the minimum and the other to the maximum diameter as marked on the rope adjustment device.

NOTE For rope adjustment devices which clearly specify in the information supplied by the manufacturer that they are to be used only with one defined anchor line of a specific diameter, it is only necessary to carry out the tests on that anchor line.

If rope adjustment devices are specifically designed for use with types of anchor lines other than those conforming to EN 1891 Type A ropes, each type and model specified in the information supplied by the manufacturer of the rope adjustment device shall be tested.

For Type A rope adjustment devices intended to be used with more than one type or model of anchor line conforming to EN 1891 Type A ropes, the rope adjustment device shall be tested with each type or model of anchor line. This can be done either fully in accordance with this European Standard or as a minimum the rope adjustment device shall meet the requirements of 4.2.5 and 4.2.6 when tested on anchor lines to EN 1891 Type A different from those listed in the information supplied by the manufacturer.

4.1.2 Compatibility

A rope adjustment device shall be compatible with and capable of attachment to an anchor line of the type and diameter range as marked on the rope adjustment device. It shall be possible to connect a rope adjustment device to an anchor line anywhere along its length (see 5.4.2).

4.1.3 Release prevention mechanism

Rope adjustment devices shall have a release prevention mechanism to prevent an anchor line, with a type and diameter range as marked on the rope adjustment device, from being released accidentally when in use.

The release prevention mechanism shall be so designed that the rope adjustment device can only be detached from or attached to the anchor line by at least two consecutive deliberate manual actions, when tested in accordance with 5.4.3.

4.1.4 Placement

Rope adjustment devices shall have a function to prevent the rope adjustment device from sliding down the anchor line unintentionally.

When tested in accordance with 5.4.4, rope adjustment devices shall not slide more than 300 mm along the vertical anchor line.

4.1.5 Locking

Rope adjustment devices shall in each case lock and remain locked until released with a test mass of 5 kg, when tested in accordance with 5.4.5.

4.1.6 Edge design

When tested in accordance with 5.4.6, rope adjustment devices shall not have sharp or rough edges that may damage other components or cause injury to the user.

4.1.7 Corrosion resistance

After testing in accordance with 5.4.7, metal parts of rope adjustment devices shall show no evidence of corrosion that would affect their function.

4.1.8 Maximum rated load

Rope adjustment devices shall have a maximum rated load of at least 100 kg for a single person rope adjustment device and at least 200 kg for a two-person rope adjustment device.

4.1.9 Functional requirements after conditioning to wet

After conditioning to wet in accordance with 5.3.5, rope adjustment devices shall meet the requirement of 4.2.5, 4.3.3 and 4.4.4 for Types A, B and C respectively.

4.1.10 Functional requirements after optional conditioning

If the information supplied by the manufacturer of the rope adjustment device (see Clause 7) claims a feature concerning the use under specific conditions (see 5.3.3, 5.3.4, 5.3.6, 5.3.7), the rope adjustment device shall meet the requirement of 4.2.5, 4.3.3 and 4.4.4 for Types A, B and C respectively.

4.1.11 Marking and information

Marking of the rope adjustment device shall be in accordance with Clause 6.

Information shall be supplied with the rope adjustment device in accordance with Clause 7.

4.2 Type A rope adjustment devices

4.2.1 General

In addition to the requirements in 4.1, Type A rope adjustment devices shall fulfil the requirements in 4.2.2, 4.2.3, 4.2.4, 4.2.5, 4.2.6 and 4.2.7.

4.2.2 Free movement

With the release prevention mechanism in position, Type A rope adjustment devices shall allow movement in one or both directions on the anchor line, when tested in accordance with 5.4.8.1.

4.2.3 Minimum working strength

Type A rope adjustment devices on an anchor line shall withstand a force equivalent to the sum of the maximum rated load as marked on the rope adjustment device plus $(1\ ^{+0,2}_{0})$ kN for $(3\ ^{+0,25}_{0})$ min with a maximum slippage of 100 mm, when tested in accordance with 5.5.2.

No part of the type A rope adjustment device shall show any signs of permanent deformation that would affect its function, and the anchor line shall not show any signs of tearing or breaking.

4.2.4 Minimum static strength

Type A rope adjustment devices shall withstand a force of 15 kN for $(3\ ^{+0,25}_{0})$ min when tested on an anchor line in accordance with 5.5.3.

For Type A rope adjustment devices that have more than one point of connection specified by the manufacturer, all points of connection shall be tested according to this requirement.

4.2.5 Dynamic performance

Type A rope adjustment devices shall have a maximum braking force F_{max} of 6 kN and an arrest distance H_a of maximum 2 m when tested in accordance with 5.6.2 with a rigid steel mass of 100 kg or a mass equivalent to the maximum rated load, whichever is the greater.

4.2.6 Dynamic strength

Type A rope adjustment devices shall not release the mass when tested in accordance with 5.6.3 with a rigid steel mass of 100 kg or a mass equivalent to the maximum rated load, whichever is the greater, and the arrest distance H_a shall be a maximum of 2 m.

4.2.7 Residual strength

When tested in accordance with 5.6.3.3, Type A rope adjustment devices shall have a minimum residual strength of (3 ± 0,1) kN for $(3\ ^{+0,25}_{0})$ min.

4.3 Type B rope adjustment devices

4.3.1 General

In addition to the requirements in 4.1, Type B rope adjustment devices shall fulfil the requirements in 4.3.2, 4.3.3 and 4.3.4.

4.3.2 Free movement

With the release prevention mechanism in position, Type B rope adjustment devices shall allow adjustment along the anchor line, when tested in accordance with 5.4.8.2.

4.3.3 Minimum working strength

Type B rope adjustment devices on an anchor line shall withstand a force of (4 ± 0,1) kN for $(3\ ^{+0,25}_{0})$ min with a maximum slippage of 100 mm when tested in accordance with 5.5.2.

No part of the Type B rope adjustment device shall show any signs of permanent deformation that would affect its function, and the anchor line shall not show any signs of tearing or breaking.

4.3.4 Dynamic strength

Type B rope adjustment devices shall not release the mass when tested as described in 5.6.3 with a rigid steel mass of 100 kg or a mass equivalent to the maximum rated load, whichever is the greater, and the arrest distance H_a shall be a maximum of 2 m.

4.4 Type C rope adjustment devices

4.4.1 General

In addition to the requirements in 4.1, Type C rope adjustment devices shall fulfil the requirements in 4.4.2, 4.4.3, 4.4.4, 4.4.5, 4.4.6, 4.4.7, 4.4.8 and 4.4.9.