SLOVENSKI STANDARD
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Osebna varovalna oprema za zaščito pred padci z višine - Naprave za spuščanje ob reševanju

Personal fall protection equipment - Descender devices for rescue

Persönliche Absturzschutzausrüstung - Abseilgeräte zum Retten

Équipement de protection individuelle contre les chutes - Descendeurs pour sauvetage

Ta slovenski standard je istoveten z: **EN 341:2011**

ICS:

13.340.60	Zaščita pred padci in zdrsi	Protection against falling and slipping

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EUROPEAN STANDARD

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English Version

Personal fall protection equipment - Descender devices for rescue

Équipement de protection individuelle contre les chutes - Descendeurs pour sauvetage

Persönliche Absturzschutzausrüstung - Abseilgeräte zum Retten

This European Standard was approved by CEN on 25 May 2011.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Page

Figures

Foreword

This document (EN 341:2011) 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of an identical text or by endorsement, at the latest by December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

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 341:1992.

Annex A provides details of significant technical changes between this European Standard and EN 341:1992.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies requirements, test methods, marking and information to be supplied by the manufacturer for descender devices, which include descent lines (hereinafter referred to as lines), intended for rescue and to protect against falls in a rescue system, which is a personal fall protection system. This European Standard does not specify requirements for descender devices that are used for descending in mountaineering, rope access or work positioning systems.

NOTE A descender device which enables the user to rescue himself and which conforms to this European Standard is personal protective equipment (PPE).

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 363:2008, *Personal fall protection equipment — Personal fall protection systems*

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

EN 365:2004, *Personal protective equipment against falls from a height — General requirements for instructions for use, maintenance, periodic examination, repair, marking and packaging*

EN 1496:2006, *Personal fall protection equipment — Rescue lifting devices*

EN 1891:1998, *Personal protective equipment for the prevention of falls from a height — Low stretch kernmantel ropes*

EN 12385-1, *Steel wire ropes — Safety — Part 1: General requirements*

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

3 Terms, definitions and classes

For the purposes of this document, the terms and definitions of EN 363:2008 and the following apply.

3.1 Terms and definitions

3.1.1
descender device
automatic (type 1) or manually-operated (type 2) device, including a line, by which persons can, at a limited velocity, rescue themselves or others from a higher to a lower position in such a way that a free fall is prevented

NOTE A line could be e.g. wire rope, textile rope, or webbing.

3.1.1.1
automatic descender device (type 1)
descender device with a braking system that does not require an intervention by the user once the descent has commenced

3.1.1.2
manually-operated descender device (type 2)
descender device with a braking system that requires an intervention by the user

3.1.1.3
control device
integral element of the descender device normally operated by hand, used to control the velocity of descent down the line

3.1.1.4
panic locking element
integral part or function of the control device which stops or slows down the descent and thereby prevents an uncontrolled descent or a fall if the user panics and operates the descender device beyond its intended control parameters

3.1.2
descent energy
energy measured in joules and expressed as *W,* which results from the product of the descent load, the gravity, the descent height and the number of descents

NOTE Descent energy $W = m \times g \times h \times n$

where

W is the descent energy, expressed in joules (J);

m is the descent load, expressed in kilograms (kg);

g is the gravity 9,81 m/s^2;

h is the descent height, expressed in metres (m);

n is the number of descents.

3.1.3
minimum rated load
minimum mass of the person(s), including tools and equipment, for the descender device, as specified by the manufacturer

NOTE Minimum rated load is expressed in kilograms.

3.1.4
maximum rated load
maximum mass of the person(s), including tools and equipment, for the descender device, as specified by the manufacturer

NOTE Maximum rated load is expressed in kilograms.

3.2 Classes

Descender devices are classified as follows:

a) class A: descent energy W up to $7{,}5 \times 10^6$ J;

b) class B: descent energy W up to $1{,}5 \times 10^6$ J;

c) class C: descent energy W up to $0{,}5 \times 10^6$ J;

d) class D: For only one descent. Descent energy depends on the maximum descent height and the maximum rated load.

NOTE In practice, descender devices are subjected to different loads. A descender device for descending, e. g. 100 passengers from a cable car at a height of 100 m, has to meet more severe requirements than a descender device used by a crane driver to descend by himself from a height of 20 m only once.

4 Requirements

4.1 General

4.1.1 Minimum rated load

The minimum rated load shall be specified by the manufacturer.

4.1.2 Maximum rated load

The maximum rated load shall be specified by the manufacturer and shall be at least 100 kg.

4.2 Design, materials and construction

4.2.1 General

Materials which may come into contact with the skin of a user shall not be known to, or suspected to, adversely affect user hygiene or health, e.g. cause irritating or sensitization effects, during normal use of the descender device.

Descender devices shall not have sharp or rough edges that may cut, abrade or otherwise damage rope or webbing or cause injury to the user.

When descender devices in accordance with this standard have a rescue lifting function, they shall in addition to this European Standard conform to EN 1496:2006, class A.

Connectors shall conform to EN 362.

4.2.2 Lines

Lines shall be made from steel or stainless steel wire rope, textile rope or webbing.

Lines shall have at least one termination. Line ends that do not have a termination shall have an end stop.

The ends of the lines shall be protected against slipping through the descender device unintentionally.

Lines including their termination(s) shall be of a type capable of visual inspection or else subject to manufacturers' guidance for appropriate examination.

4.2.2.1 Wire rope lines

Wire rope lines shall be made from one piece and shall be stress and torsion relieved.

Wire rope lines made from steel except stainless steel shall be galvanized to EN 12385-1.

The nominal tensile strength of the wires of the steel or stainless steel wire rope shall not exceed 1960 N/mm^2.

NOTE 1 A limit of the nominal tensile strength is necessary, because the wires become too brittle with a higher nominal tensile strength.

NOTE 2 Manufacturers of descender devices should be particularly careful when selecting lines made from stainless steel as some types of stainless steel can have unpredictable fatigue and corrosion characteristics.

4.2.2.2 Textile rope lines

Textile rope lines for descender devices, class A, B or C shall be of kernmantel construction and shall conform to EN 1891:1998, type A, 4.1 to 4.10.

4.2.2.3 Webbing lines

Webbing lines shall meet the requirements of EN 1891:1998, 4.5, 4.6 and 4.10.

Webbing lines shall be made from virgin filament or multi-filament synthetic fibres suitable for the use intended. The breaking tenacity of the synthetic fibre shall be known to be at least 0,6 N/tex.

The materials used for the construction of the webbing line shall be known to have a melting point of more than 195 °C. Webbing lines made from polypropylene or polyethylene shall not be used.

4.2.2.4 Line integrity

When tested in accordance with 5.9, lines made of stainless steel wire rope or made of textiles containing aramid fibres shall withstand a test force as given in 4.6, applied for 3 min.

4.2.2.5 Terminations, end stops

Lines shall be terminated in such a manner that they can be connected, directly or by an appropriate connector as specified by the manufacturer, to a body holding device, e.g. a rescue harness or a rescue loop, or to an anchor device.

Reinforcement or another method shall be used to protect terminations from concentrated wear at all webbing-to-metal fitting interfaces.

All splices shall be secured to prevent the splice from coming open in use.

Eye splices in laid fibre rope shall consist of at least four tucks using all the yarns in the strands. The length of the splicing tails emerging after the last tuck shall be at least one rope diameter.

Threads used for sewing shall be physically compatible with the webbing/rope, and the quality shall be compatible to that of the webbing/rope. They shall, however, be of a contrasting shade or colour in order to facilitate visual inspection.

When using a knot for forming a termination or as an end stop, the knot shall be secured so that it cannot be opened without the use of a tool. When tested in accordance with 5.6, the tail end of the knot shall have a minimum length of 100 mm.

Webbing ends shall be sealed or otherwise prevented from unravelling.

Eye terminations of wire ropes shall be made with thimbles and by splices or with thimbles and by pressed ferrules.

4.3 Dynamic strength

When tested in accordance with 5.3, the descender device shall not release the test mass and no part of the descender device shall show any signs of breaking or tearing.

4.4 Function

4.4.1 Classes A, B and C

When tested in the dry and wet condition in accordance with 5.4.1 and 5.4.2:

a) it shall be possible to maintain a continuous descent velocity between 0,5 m/s and 2 m/s;

b) in the case of a manually-operated descender device, the velocity shall not exceed 2 m/s when the control device is in a hands-off position or if applicable any panic locking element is engaged;

c) none of the parts of the descender device handled by the user to control the descents shall develop a temperature higher than 48 °C during the descents.

When tested in wet and cold conditions in accordance with 5.4.3, it shall be possible to maintain a continuous descent velocity between 0,5 m/s and 2 m/s.

If the manufacturer claims that the descender device can be used at temperatures lower than – 4 °C, it shall be possible to maintain a continuous descent velocity between 0,5 m/s and 2 m/s when tested in very cold conditions in accordance with 5.4.4.

4.4.2 Class D

When tested in the dry condition in accordance with 5.4.1:

a) it shall be possible to maintain a continuous descent velocity at a maximum of 2 m/s;

b) in the case of a manually-operated descender device, the velocity shall not exceed 2 m/s when the control device is in a hands-off position or if applicable any panic locking element is engaged;

c) none of the parts of the descender device handled by the user to control the descent shall develop a temperature higher than 48 °C during the descent.

If the manufacturer claims that the descender device can be used in wet conditions, it shall be possible to maintain the descent velocity at a maximum of 2 m/s when tested in the wet conditions in accordance with 5.4.2.

If the manufacturer claims that the descender device can be used in the temperature range of (- 4 to + 2) °C, it shall be possible to maintain the descent velocity at a maximum of 2 m/s when tested in the wet and cold conditions in accordance with 5.4.3.

If the manufacturer claims that the descender device can be used at temperatures lower than – 4 °C, it shall be possible to maintain a continuous descent velocity at a maximum of 2 m/s when tested in the very cold conditions in accordance with 5.4.4.

4.5 Descent energy

When tested in accordance with 5.5, with the descents being carried out in succession, descender devices, class A, B and C shall meet the following requirements:

a) they shall resist the descent energy determined for their class;

b) the temperature due to friction shall not affect the function of the descender device;

c) it shall be possible to maintain the descent velocity between 0,5 m/s and 2 m/s;

d) none of the parts of the descender device handled by the user to control the descents shall develop a temperature higher than 48 °C during the descents.

NOTE This test is not required for Class D descender devices, as they are intended for a single use only.

4.6 Static strength

When tested in accordance with 5.6, first test, descender devices, class A, B and C shall withstand a test force of 10 times the maximum rated load, but at least 12 kN, applied for 3 min.

When tested in accordance with 5.6, first test, descender devices, class D shall withstand a test force of twice the maximum impact force recorded in the dynamic test of 5.3, but at least 5 times the maximum rated load, applied for 3 min. If manually-operated devices are tested in several locked positions, the highest of the measured values shall be used as a basis for establishing the static strength test force.

When tested in accordance with 5.6, second test, descender devices, classes A, B, C and D shall withstand a test force of 5 times the maximum rated load, but at least 6 KN, applied for 3 min.

4.7 Corrosion resistance

After testing in accordance with 5.10, no part of the descender device shall show evidence of corrosion that would affect its function.

NOTE 1 White scaling or tarnishing is acceptable if the function is not impaired.

NOTE 2 Conformity with this requirement does not imply suitability for use in a marine environment.

4.8 Additional requirements for manually-operated descender devices (type 2)

4.8.1 Operating force

When tested in accordance with 5.7, with a force equal to the maximum rated load, the force to release and operate the integral manually-operated control element of the descender device shall not exceed 450 N.

4.8.2 Holding force

When descender devices of a design where the user controls the descent manually by holding the line are tested in accordance with 5.8, with a force equal to the maximum rated load, the maximum force necessary to hold the test mass shall not exceed 200 N.

4.9 Additional requirements for descender devices, class D

After testing in accordance with 5.4, Class D descender devices shall indicate clearly that they have been used.

4.10 Marking and information

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

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

5 Test methods

5.1 Test samples

A minimum of two new descender devices shall be provided: one for the purposes of the tests specified in 5.2 and 5.10 and one for the purposes of the tests specified in 5.3, 5.4, 5.5, 5.6, 5.7 and 5.8.