SLOVENSKI STANDARD
SIST EN 17520:2022

01-februar-2022

Gorniška oprema - Popkovine - Zahteve in preskusne metode

Mountaineering equipment - Personal belay lanyards - Safety requirements and test methods

Bergsteigerausrüstung - Selbstsicherungsverbindungsmittel - Sicherheitstechnische Anforderungen und Prüfverfahren

Équipement d'alpinisme et d'escalade - Longes d'auto-assurage - Exigences et méthodes d'essai

Ta slovenski standard je istoveten z: **EN 17520:2021**

ICS:

97.220.40	Oprema za športe na prostem in vodne športe	Outdoor and water sports equipment

SIST EN 17520:2022 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 17520

November 2021

ICS 97.220.40

English Version

Mountaineering equipment - Personal belay lanyards - Safety requirements and test methods

Équipement d'alpinisme et d'escalade - Longes d'auto-assurage - Exigences de sécurité et méthodes d'essai

Bergsteigerausrüstung - Selbstsicherungsverbindungsmittel - Sicherheitstechnische Anforderungen und Prüfverfahren

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

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Ref. No. EN 17520:2021 E

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European foreword

This document (EN 17520:2021) has been prepared by Technical Committee CEN/TC 136 “Sports, playground and other recreational facilities and equipment”, 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of an identical text or by endorsement, at the latest by May 2022, and conflicting national standards shall be withdrawn at the latest by May 2022.

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For relationship with EU Regulation(s), see informative Annex ZA, which is an integral part of this document.

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Introduction

The text of this document is based on the former UIAA-Standard 109:2018 (Union Internationale des Associations d'Alpinisme/ International Climbing and Mountaineering Federation), which was developed with international participation.

This document is part of a series of standards on mountaineering equipment, see Annex A.

1 Scope

This document specifies safety requirements and test methods for lanyards intended to be the primary connection between the climber and the belay stance with the ability to withstand a dynamic impact. Lanyards intended only for positioning (e.g. daisy chain) or energy absorption in via ferrata or lanyards for rope courses are not covered by this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 362:2004, *Personal protective equipment against falls from a height — Connectors*

EN 892:2012+A1:2016, *Mountaineering equipment — Dynamic mountaineering ropes — Safety requirements and test methods*

EN 12275:2013, *Mountaineering equipment — Connectors — Safety requirements and test methods*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

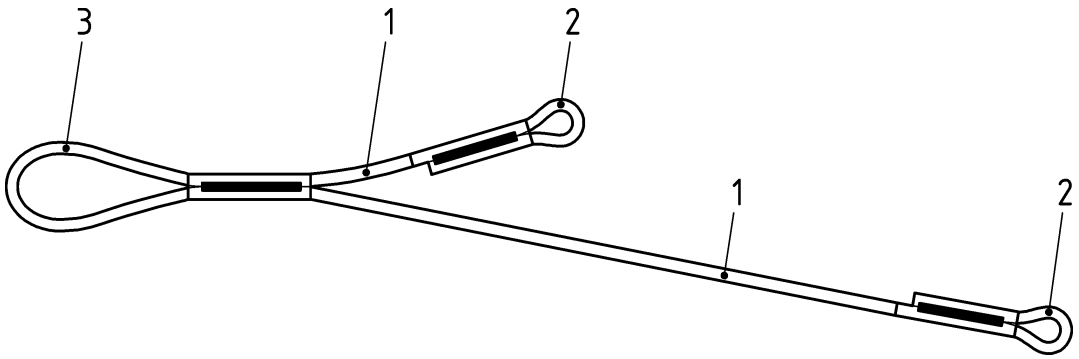
— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
personal belay lanyard
flexible connecting element able to absorb energy in case of fall, with at least two connecting points, used to connect the user's harness to the belay stance and if relevant to a climbing device (e. g. descender, progress capture device)

3.2
adjustable personal belay lanyard
personal belay lanyard whose length is intended to be adjusted using the manufacturer's instructions and information

3.3
multi-arms personal belay lanyard
personal belay lanyard with a maximum of two arms fitted with connecting points, one or both arms may be adjustable

Note 1 to entry: See Figure 1 for an example.



Key

1 Arms
2 Connecting points
3 Connecting point to be connected to the harness

Figure 1 — Example of multi-arms personal belay lanyard

4 Safety requirements

4.1 Design and ergonomics

4.1.1 When checked in accordance with 5.1, the personal belay lanyard shall not have sharp edges or burrs that could cause injury to the user or that could cut, abrade or otherwise cause damage to the personal belay lanyard itself.

4.1.2 The adjustable personal belay lanyard has to be fitted with a permanent end stop which shall prevent unintentional detachment of the length adjustment device from the personal belay lanyard.

Check in accordance with 5.1.

4.1.3 When the personal belay lanyard is provided with a connector intended to be attached to the belay stance, this connector shall be fitted with a gate-locking device and conform to EN 12275:2013 Class T and/or EN 362:2004 Class T or Class M. For any other class the connector shall be provided with a component that ensures that the connector is loaded only along its major axis.

4.1.4 When checked in accordance with 5.1 where stitching providing safety and strength could be subject to abrasion, the stitching shall contrast in colour with the personal belay lanyard material.

4.1.5 When checked in accordance with 5.1, the markings shall be perfectly visible and remain so throughout the foreseeable useful life of personal belay lanyards.

4.2 Dynamic test

When tested in accordance with 5.2, the personal belay lanyard shall not release the mass in any of the three successive falls. The peak force of the first fall shall not exceed 10 kN.

If the personal belay lanyard has a fall indicator as claimed by the manufacturer, check after the first fall that the fall indicator is activated.

NOTE The risk of a fall on two arms, which would increase the impact force, has been taken into account by the limitation of the impact force to 10 kN on one single arm.

4.3 Slippage test

For adjustable personal belay lanyard the slippage shall not be more than 50 mm, when tested in accordance with 5.3.

5 Test methods

5.1 General

Verify by reference to appropriate documentation and by visual and/or tactile examination of the personal belay lanyard.

5.2 Performance of dynamic test

5.2.1 Test samples

For personal belay lanyards designed in different maximum lengths, test the longest and the shortest.

The three consecutive fall tests shall be carried out with the same sample.

For multi-arms personal belay lanyard, if arms are not identically designed, each arm shall be tested individually with a new sample.

When testing an adjustable personal belay lanyard, position the adjustment device so that the personal belay lanyard is tested at 80 % of its maximum length at the second fall.

5.2.2 Conditioning and tests conditions

Dry the test samples for at least 24 h in an atmosphere of (50 ± 5) °C and less than 20 % relative humidity.

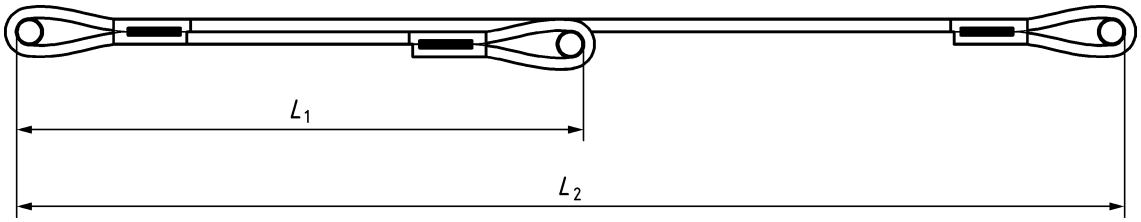
Then condition these test samples in an atmosphere of (23 ± 2) °C and (50 ± 5) % relative humidity for at least 72 h.

Then start testing these samples at a ~~room temperature of~~ (23 ± 5) °C within 5 min.

5.2.3 Measurement of the maximum length *L*

Attach both terminations of the sample as described in the manufacturer's instructions and information to rigid bars of Ø (10 ± 0,2) mm. If the personal belay lanyard is adjustable, extend it to its maximum length. Apply a load with a mass of (10 ± 0,1) kg, without shock by the means of a rigid bar of Ø (10 ± 0,2) mm to the opposite termination. Maintain the load for (60 ± 5) s. Then within 15 s, with the load still applied, measure the maximum length *L*, see Figure 2, of the personal belay lanyard between the load bars in contact with the termination lanyard, in metres to the nearest 0,01 m.

For multi-arms personal belay lanyard, if arms are not identically designed, measure the maximum length *L* of each arm.



Key

L_1 Maximum length of arm 1 under load L_2 Maximum length of arm 2 under load

Figure 2 — Example of maximum length *L* with a multi-arms personal belay lanyard.

5.2.4 Apparatus for the dynamic strength test

Use a guided mass drop test rig as specified in EN 892:2012+A1:2016, 5.6.2 with a mass of (80 ± 0,1) kg.

5.2.5 Dynamic strength test

5.2.5.1 Personal belay lanyard

Attach the end termination intended for connection to the harness to the falling mass as described in the manufacturer's instructions and information (e.g. lark's foot) and the opposite end termination to the anchor point.

For multi-arms personal belay lanyard, if arms are not identically designed, each arm shall be tested individually with a new sample.

Load the test sample with the falling mass as a static load for a period of (60 ± 5) s.

Within (120 ± 15) s raise the mass to a height of 2 × L. Release the mass.

Record the peak force for the first drop only.

Repeat the test two more times, with (5 ± 0,25) min between each drop, for a total of 3 drops, each time raising the mass to the same initial position.

5.2.5.2 Adjustable personal belay lanyard

Attach the end termination intended for connection to the harness to the falling mass as described in the manufacturer's instructions and information (e.g. lark's foot) and the opposite end termination to the anchor point. Adjust it to the length *L* as measured in 5.2.3.

Load the test sample with the falling mass as a static load for a period of (60 ± 5) s.

1) 1st drop: Within (120 ± 15) s, raise the mass to a height of 2 × *L*. Release the mass. Record the peak force.

2) 2nd drop: Within (5 ± 0,25) min, adjust the personal belay lanyard to (80± 2) % of its maximum length *L* as measured in 5.2.3 and raise the mass to a height of 1,6 × *L*. Release the mass. Record the peak force only for the 1st drop.

3) 3rd drop: Within (5 ± 0,25) min, raise the mass to a height of 2 × *L* with adjustable personal belay lanyard adjusted to the maximum length *L* as measured in 5.2.3. Release the mass.

5.3 Slippage test for adjustable personal belay lanyard

5.3.1 Conditioning and test conditions

Put a test sample in tap water at a temperature of (20 ± 5) °C for one hour. Then start testing the sample at a temperature of (23 ± 5) °C within 10 min.

Adjust the adjustable personal belay lanyard to its shortest length. Attach the test sample as described in the instruction for use (e.g. lark's foot) between two bars of Ø (10 ± 0,2) mm to the lanyard.

Determine the loading speed, v, as a function of the free maximum length of the test sample, using Formula (1) with an accuracy of ± 20 %:

$$v = 0{,}5\ L \quad (1)$$