



BELAY LANYARD

Climbing and
Mountaineering Equipment

UIAA
109

Foreword

This UIAA Standard is only published in the English language version, which is the master text. For any validations in translation, the UIAA Safety Commission should be contacted via the UIAA Office in Bern, Switzerland.

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VERSION

UIAA 109 V8

LAST UPDATED

15th June 2018

COMPLIANCE DATE

immediate

Copyright and Version Management

This document was first published in English. The English master text is decisive in any conflict of interpretation. For any validations in translation the UIAA should be contacted via the UIAA Office in Bern, Switzerland.

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The Version number refers to the latest revision, e.g. V4 is the fourth change to the document. The last update is the date of this latest version.

1. General Remarks on the UIAA Trademark and UIAA Label

- 1.1. The UIAA Trademark (see section 9.1.) is copyright protected internationally. The UIAA Label is only given to items of mountaineering and climbing equipment upon approval of prospective label holder's application from the UIAA.
- 1.2. The procedure to be followed by a manufacturer, when applying for a UIAA Label, is laid down in the "General Regulations for the UIAA Safety Label Certification"

2. Scope

This standard applies to lanyards intended to be the primary connection between the climber and the belay stance.

NOTE: lanyards intended only for positioning are not covered by this standard (e.g. daisy chain).

3. Definitions

For the purpose of this standard, the following definitions apply:

3.1 Belay Lanyard

Flexible connecting element with at least two terminations, able to absorb energy of a fall factor 2, used to connect the harness to belay stance.

3.2 Adjustable belay lanyard

Belay lanyard whose length may be adjusted according with the manufacturer's instructions.

4. Safety Requirements

The UIAA Label can only be granted for belay lanyard which meets all the following requirements:

4.1 Design and ergonomics

- 4.1.1 When checked in accordance with 5.1, belay lanyard shall not have sharp edges or burrs that may cause injury to the user, or that may cut, abrade or otherwise cause damage to the belay lanyard itself.
- 4.1.2 When checked in accordance with 5.1, adjustable belay lanyard shall be fitted with an end stop which shall prevent unintentional detachment of the length adjustment device from the belay lanyard.
- 4.1.3 If the belay lanyard is intended to be connected to the harness via a connector, the connector shall conform to EN 12275 class Q or class T.
- 4.1.4 If the belay lanyard is provided with a connector intended to be attached to the anchor, this connector shall conform to EN 12275 class T. Alternatively, the belay lanyard shall be designed or provided with a component that allows the connector to be loaded only along its major axis.
- 4.1.5 When checked in accordance with 5.1 where stitching is used to provide safety and strength (e.g. in joints) the stitching shall be accessible for visible inspection and shall contrast with the belay lanyard material in colour.
- 4.1.6 When using a knot for forming a termination, the knot shall be secured so that it cannot be opened without the use of a tool.

4.2 Static strength test

When tested in accordance with 5.2, the belay lanyard shall withstand a force of at least 15 kN.

4.3 Dynamic test(s)

When tested in accordance with 5.3, the belay lanyard shall withstand 3 successive falls. The peak force of the first fall shall be less than 10 kN.

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

4.4 Slippage test

For adjustable belay lanyard the slippage shall not be more than 50 mm, when tested in accordance with 5.4.

5. Tests Methods

5.1 Verify by reference to appropriate documentation and by visual and tactile examination of the lanyard that it conforms to 4.1.

5.2 Static strength test

5.2.1 Test sample

Each test shall be carried out on a new sample.

For single arm belay lanyard, test the shortest length.

For multi-arms belay lanyard, if arms are not identical, each arm shall be tested individually.

If arms are identical, except the length, test only the shortest arm.

For the testing of an adjustable belay lanyard, position the adjustment device so that the belay lanyard is tested in its maximum length.

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 ± 2) % relative humidity for at least 72 h.

Then start testing these samples at a temperature of (23 ± 5) °C within 10 min.

5.2.3 Determination of tensile strength

Attach the test sample as described in the instruction for use (e.g. lark's foot) between two bars offering a contact radius of $(5 \pm 0,05)$ mm to the lanyard and with a mean roughness value R_a not exceeding $0,8 \mu\text{m}$ and a peak to valley height R_{max} , not exceeding $6,3 \mu\text{m}$.

Determine the loading speed, v , as a function of the free length of the test sample, using Equation (1): $v = 0,5 l$ with an accuracy of $\pm 20 \%$ (1)

Where:

v is the loading speed in millimetre per minute;

l is the free length in millimetre of the test sample overall laid out in the flat.

Apply the force until breaking the belay lanyard and check the requirement of 4.2 is met.

5.3 Dynamic test(s)

5.3.1 Test sample

One unused sample shall be used for each arm test.

For multi-arm lanyard, if arms are not identical, each arm shall be tested individually.

5.3.2 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 ± 2) % relative humidity for at least 72 h.

Then start testing these samples at a temperature of (23 ± 5) °C within 10 min.

5.3.3 Measurement of the maximum length of the belay lanyard

Attach one end of the sample to a suitable fixture as described in the instructions for use.

If the belay lanyard is adjustable, extend it to its maximum length.

Apply a load without shock in the form of a mass of $(10 \pm 0,1)$ kg, or a corresponding force, to the other end of the belay lanyard. Maintain the load described above for (60 ± 15) s. Within 10 s, with the load still applied, measure the belay lanyard length L between the extremity load bearing points, in metres to the nearest 0,01 m.

5.3.4 Apparatus

Use the drop test apparatus as specified in clause 5.6.2 of EN 892 with a mass of $(80 \pm 0,1)$ kg.

5.3.5 Dynamic strength test

For adjustable belay lanyard, adjust it to $(80\% \pm 2\%)$ of its length L as measured in 5.3.3.

Attach the test sample to the falling mass as described in the instructions for use. (e.g. lark's foot) and to the anchor point.

Load the test sample with the falling mass as a static load for a period of (60 ± 15) s.

Raise the mass, for non-adjustable belay lanyard $2 \times L$ and $1,6 \times L$ for adjustable belay lanyard in order to create a factor 2 fall and set this as the drop height.

Release the mass.

Record the peak force for the first drop only.

Repeat test two more times, with $5 \pm 0,25$ min between each drop, for a total of 3 drops, each time raising the mass to the same drop height. Do not adjust the length of an adjustable belay lanyard if any slippage occurred in previous tests.

5.4 Slippage test for adjustable belay lanyard

5.4.1 Conditioning and tests conditions

Put a test sample in tap water at room temperature of (23 ± 5) °C for one hour.

Then start testing these samples at a temperature of (23 ± 5) °C within 10 min.

Attach the test sample as described in the instruction for use (e.g. lark's foot) between two bars offering a contact radius of $(5 \pm 0,05)$ mm to the lanyard and with a mean roughness value R_a not exceeding $0,8 \mu\text{m}$ and a peak to valley height R_{max} , not exceeding $6,3 \mu\text{m}$.

Determine the loading speed, v , as a function of the free length of the test sample, using Equation (1): $v = 0,5 l$ with an accuracy of $\pm 20 \%$ (1)

Where:

v is the loading speed in millimetres per minute;

l is the free length in millimetres of the test sample overall laid out in the flat.

5.4.2 Determination of slippage

Apply a force of (100 ± 10) N and mark the belay lanyard as close as possible of the length adjustment device. Increase the force until $(2 +0.1/-0)$ kN and measure the slippage. Check that the requirement of 4.4 is met.

6. Markings

Belay lanyard shall be marked clearly, indelibly and durably with at least the following information:

- a) Name of the manufacturer or its authorized representative;
- b) Identification of the name, if several models are marketed by the same manufacturer;
- c) Year of manufacture

7. Information to be supplied

The "information to be supplied" shall be given in Standard English and, if required, in the official language(s) of the country in which the product is made available on the market. As an alternative to a printed form, the information may be provided via an electronic or other data storage format link (e.g. a QR code) allowing the downloading of the information. The information link shall be preceded or surmounted by an icon showing an open booklet; the information link and icon may be directly printed on the product in a clearly visible and accessible place and contain at least the following:

- a) The name of the manufacturer or its representative
- b) Reference to this UIAA standard, (i.e. UIAA 109)
- c) The meaning of any markings on the product
- d) How to use the product (e.g. installation on the harness, connection to anchor point...)
- e) How to choose other components for use in the system (e.g. connectors, harness ...)
- f) How to maintain/service the product, on the effects of chemical reagents and how to disinfect the product without adverse effect
- g) The lifespan of the product and how to assess it
- h) Influence of wet and icy conditions
- i) Danger related to factors and situations that could affect the performances of the product (e.g. sharp edges, knots...)
- j) Influence of storage and ageing due to use
- k) The anchor point for the system should preferably be located above the user's position

- l) If relevant, how to check the deployment of the fall indicator
- m) A warning to state that this product shall not be used for via ferrata

8. Demonstrating that Requirements are met

8.1 The safety requirements shall be satisfied by a test report from a UIAA-approved test laboratory

9. Attachment of the UIAA Label

9.1 For any model of mountaineering equipment, which has been awarded the UIAA Label, the UIAA recommends that the UIAA Trademark (see below) or the four letters "UIAA" be marked clearly and indelibly on each item sold in accordance with the branding guidelines specified in the "General regulations for UIAA Safety Label".



9.2 In addition, the UIAA Trademark or the four letters "UIAA" may be included in the instructions for use and/or on a swing ticket as well as in catalogues and other publications of the manufacturer. In the last case, the illustration and/or the text must clearly apply only to the equipment which has been awarded the UIAA Label.

Last Updated	Remarks
1st June 2017	removal of five drops and addition of a fall arrest indicator
18 th May 2018	decreasing the value of first peak force to 10 kN in dynamic test. 3 falls required
23 rd May 2018	Editorial comments
1st June 2018	Editorial comments
15 June 2018	<i>Editorial comments</i>

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