



## 'CRASH PADS'

### Climbing and Mountaineering Equipment

# UIAA 161

#### 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.

UIAA Standards are the only 'globally recognized' standards for mountaineering equipment.

The UIAA Standards are reviewed at intervals to see whether they meet the latest technical requirements and revised if necessary.

The UIAA invites manufacturers of mountaineering and climbing equipment worldwide to become members of the UIAA Safety Commission as Safety Label Holders. Members can participate in discussions on standard requirements, test methods and revisions thereof (see the "General Regulations for the UIAA Safety Label").

A [complete list of UIAA Standards](#) for mountaineering and climbing equipment can be found on the UIAA website.

**This standard has been created and updated based on scientific research coordinated and funded by UIAA, as a service to all mountaineers.**

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## 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.

UIAA declarations, standards, documents, and guidelines are subject to review. Updates are recorded in the version details stated on the front page of this document.

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The version number refers to the latest revision, e.g. UIAA 161-1 is the first published version and UIAA 161-4 would be the fourth change to the document. The date is the publication of this latest version.

## 1. General Remarks on the UIAA Trademark and UIAA Label

- 1.1. The UIAA Trademark (see section 5.1.) 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 specifies safety requirements and test methods for crash pads for use in bouldering climbing.

## 3. Definitions

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

- 3.1. Crash Pad: a pad intended to be placed below a climber during bouldering to attenuate the effect of the impact when falling.
- 3.2. Impact attenuation: a property of a surface that dissipates the kinetic energy of an impact by localized deformation such that the acceleration is reduced
- 3.3. Critical fall height: maximum free height of fall from the top of the crash pad to the lowest part of the climber for which a surface will provide an acceptable level of impact attenuation, determined as described in 5.1.
- 3.4. Head injury criterion (HIC) value: criterion for head injury caused from falls as calculated in accordance with 5.6.

## 4. Safety Requirements

### 4.1. Design

- 4.1.1. Dimensions: no minimum or maximum dimensions are required, a crash pad shall be easily transportable by a single person.

### 4.2. Critical fall height

When tested in accordance with 5. the critical fall height shall be determined as the lowest drop height producing a HIC value of 400.

## 5. Test

### 5.1. Principle:

Test specimens are struck by an instrumental head form in a defined series of impacts from different drop heights. The signal emitted by an accelerometer in the head form during each impact is processed to yield a severity from the measured impact energy, defined as head injury criterion (HIC). The HIC of each impact is plotted and the critical fall height is determined as the lowest drop height producing a HIC value of 400.

5.2 Apparatus: See *EN 1177:2008, 4.2. Apparatus*

5.3 Accuracy of tests: See *EN 1177:2008, 4.3. Accuracy of tests*

5.4 Conditions for testing: See *EN 1177:2008, 4.4. conditions for testing*

5.5 Procedure: Follow the procedure in *EN 1177:2008, 4.5. Procedure*, where 4.5.3 is replaced by the following:

The tests shall be done on 3 samples.

Conduct the drop test (minimum 4 drops heights) for each test position, each drop should be completed within 15 minutes, in the following positions:

- a) In the center ( $\pm 10$  cm) of the pad or the center of each part of the pad.
- b) In the center ( $\pm 10$  cm) of a joint between two pad parts.
- c) At any inhomogeneity or discontinuity ( $\pm 10$  cm) to obtain the lowest value for the critical falling height anywhere on the pad, but never at fewer than 250 mm from any edge.

Record HIC value.

5.6 Calculation of results: See *EN 1177:2008, 4.6. Calculation of result*, where 4.6.3 is replaced by the following:

For each position (center, joint and place(s) of inhomogeneity if relevant) calculate the average of the 3 values found on each sample, and as result for the critical falling height consider the lowest value. Round the result to the nearest multiple of 5 cm (for example: 2,33 m would round to 2,35 m).

5.7 Conditions for testing: See *EN 1177:2008, 4.4. conditions for testing*

Procedure Test report: See *EN 1177:2008, 4.7. Test report*

## 6. Information to be supplied

6.1. 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.

- a) The name or trademark of the manufacturer, importer, or supplier
- b) The critical fall height as determined in 5.1.
- c) How to use the product
- f) How to choose other components for use with the product, if relevant
- g) How to maintain and service the product
- h) The lifespan of the product
- i) The effects of chemical reagents and temperature on the product.

## 7. Marking

Crash pads shall be marked with at least the following information:

- a) name or trademark of the manufacturer, importer or supplier
- b) the critical fall height as determined in 5.1.

## 8. Demonstrating that the requirements are met

8.1. The safety requirements shall be satisfied by either

- a. test report from a UIAA-approved test laboratory, or
- b. test report from a test laboratory acceptable to an EU Notified Body.

8.2. Every test shall be carried out on three items of production, and every item of production shall pass the test(s).

## 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".



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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.

**Annex A**

See Annex A of EN 1177:2008

**Annex B**

See Annex B of EN 1177:2008

UIAA 161 Crash Pads revision history	
Date	Comments
Feb 2018	Update to style and font
June 2017	<b>Has been updated with:</b> 6.1 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. Unanimously approved Safecom Worden June 2017
June 2015	Accepted, Chamonix, June 2015; proof edits to be made
November 2015	Accepted, corresponding vote, Oct 2015; proof edits and inclusion of details for joint and edge testing in section 4.5.
December 2015	Further clarifications added without vote: clarifications better define the method, but do not change it.