

# Mountaineering equipment — Energy absorbing systems for use in klettersteig (via ferrata) climbing — Safety requirements and test methods

The European Standard EN 958:2006 has the status of a  
British Standard

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# National foreword

This British Standard was published by BSI. It is the UK implementation of EN 958:2006. It supersedes BS EN 958:1997 which is withdrawn.

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A list of organizations represented on SW/136/5 can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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English Version

**Mountaineering equipment - Energy absorbing systems for use  
in klettersteig (via ferrata) climbing - Safety requirements and  
test methods**

Équipement d'alpinisme et d'escalade - Absorbeur  
d'énergie utilisé en Via Ferrata - Exigences de sécurité et  
méthodes d'essai

Bergsteigerausrüstung - Fangstoßdämpfer für die  
Verwendung auf Klettersteigen - Sicherheitstechnische  
Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 25 October 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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## Foreword

This document (EN 958:2006) has been prepared by Technical Committee CEN/TC 136 "Sports, playground and other recreational 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of an identical text or by endorsement, at the latest by June 2007, and conflicting national standards shall be withdrawn at the latest by June 2007.

This document supersedes EN 958:1996.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to support Essential Requirements of EU Directive 89/686/EEC.

For relationship with EU Directives, 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**

The text of this European Standard is based on the former UIAA-Standard N (Union Internationale des Associations d'Alpinisme), which has been prepared with international participation.

This European Standard is one of a package of standards for mountaineering equipment, see Annex A.

## 1 Scope

This European Standard specifies safety requirements and test methods for energy absorbing systems for use in climbing on a klettersteig (via ferrata).

## 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 ISO 139, *Textiles — Standard atmospheres for conditioning and testing (ISO 139:2005)*

ISO 6487, *Road vehicles — Measurement techniques in impact tests — Instrumentation*

## 3 Terms and definitions

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

### 3.1

#### **klettersteig**

rock climbing route with artificially constructed, permanent belay

NOTE In some cases the term "via ferrata" is used instead of "klettersteig".

### 3.2

#### **energy absorbing system**

device with two or more attachment points, used to reduce the impact force on the anchorage and on an attached climber during a fall

### 3.3

#### **braking length**

increase in the distance between the two attachment points measured at the end of the braking action

## 4 Safety requirements

### 4.1 Design

#### 4.1.1 Load bearing connections

All textile load bearing connections shall be designed so that they cannot be altered by the user.

#### 4.1.2 Connectors

If an energy absorbing system is fitted with connectors for attachment to a via ferrata, these connectors shall be type K connectors according to EN 12275.

#### 4.1.3 Construction

The energy absorbing system shall be designed so that it cannot be disassembled into its component part, except for the connectors.

## 4.2 Operation of the energy absorbing system

**4.2.1** When tested in accordance with 5.5.2, the static force to initiate operation of the energy absorbing system shall be greater than 1,2 kN.

**4.2.2** When tested in accordance with 5.5.3:

- the maximum impact force shall not exceed 6 kN;
- the maximum braking length shall not exceed 1 200 mm.

## 4.3 Strength of the energy absorbing system

When tested in accordance with 5.5.4, after being subjected to the test in accordance with 5.5.2, the energy absorbing system shall withstand a static force of 9 kN without breakage.

# 5 Test methods

## 5.1 Design

Check by visual examinations and handling that the requirements specified in 4.1.1 to 4.1.3 are met.

## 5.2 Test sequence

The test samples shall be subjected to the test according to 5.5.2. Additional test samples shall be subjected to the tests according to 5.5.3 and 5.5.4, in that order.

## 5.3 Conditioning and test conditions for energy absorbing systems with textile components

Condition the test samples in accordance with EN ISO 139. Tests may then be done outside the conditioning room, but the temperature shall be  $(23 \pm 5) ^\circ\text{C}$  and the tests shall begin within 5 min of removal from conditioning room.

## 5.4 Apparatus

For the test in accordance with 5.5.3, the force measuring device and its associated recording equipment shall meet the following requirements in accordance with ISO 6487:

- a) the apparatus for measuring and recording the arresting impact force shall correspond with ISO 6487, channel frequency class (CFC) 30;
- b) the force transducer, in its operating position attached to the fixed point, shall not have a resonance frequency below 100 Hz;
- c) the channel amplitude class (CAC) shall be at least 20 kN;
- d) the error of the measurement of the arresting impact force (static calibration) shall be less than 1 %;
- e) the position of the upper timing point shall correspond with the position of the falling mass when it has fallen  $(4\,500 \pm 2)$  mm from its initial pre-release position. The position of the lower timing point shall be  $(1\,000 \pm 2)$  mm vertically below the upper timing point. Release the falling mass from its normal release position, but without any rope attached. Check that the time interval between the falling mass passing the upper and lower timing points is within the range  $(101,1^{+1,3}_{-0,3})$  ms.



## 5.5 Procedure

### 5.5.1 General

Carry out the test described in 5.5.2 to 5.5.4 for each of the possible different combinations of attachment between body and klettersteig, allowable by the manufacturer. Use a new sample for each combination.

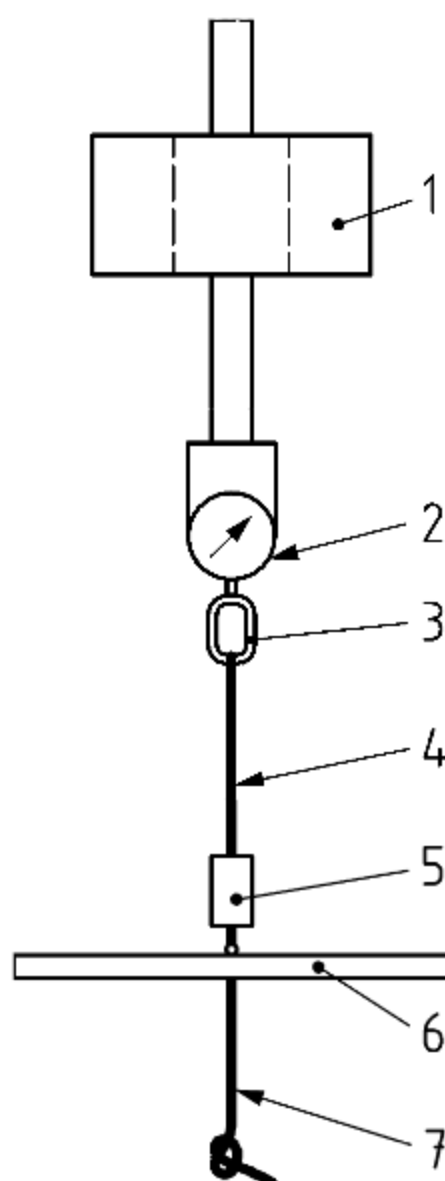
### 5.5.2 Determination of the static force to initiate operation

Mount the test sample in a tensile testing machine according to the combination described in 5.5.1.

Apply a progressively increasing force at an operating speed of 100 mm/min to 150 mm/min and check that the operation of the energy absorbing system does not occur below 1,2 kN.

### 5.5.3 Determination of impact force and braking length

Suspend the test sample from a fixed point by the via ferrata attachment points as described in 5.5.1 via a force measuring device, see example in Figure 1.



#### Key

- 1 falling mass 80 kg (guided)
- 2 force measuring device
- 3 connector attached to the via ferrata attachment point
- 4 connecting element
- 5 energy absorber system
- 6 catch-plate attached to the body attachment point
- 7 braking element

Figure 1 — Example of test configuration

Attach a catch-plate to the other attachment point. Measure and record the distance apart of the two attachment points of the energy absorbing system in the position loaded only by the catch plate.

Subject the test sample to the impact loading of a mass of  $(80 \pm 0,1)$  kg falling a distance of  $(5\,000 \pm 20)$  mm. The mass shall fall under gravity, guided, onto a rigid non-compressible catch-plate of mass  $(5 \pm 0,1)$  kg.

Record the force between the fixed point and the attachment point of the test sample throughout the test. Record the peak force corresponding to the impact.

After the falling mass has come to rest, measure within 1 min after fall the distance apart of the two attachment points of the energy absorbing system under the static load of the falling mass. Calculate and record the braking length.

#### **5.5.4 Determination of static breaking force**

Mount the test sample in the configuration arising at the end of the previous test between the two attachment points in a tensile testing machine.

Apply a progressively increasing force at an operating speed of (100 to 150) mm/min until the force exceeds 9 kN.

## **6 Marking**

Energy absorbing systems shall be marked clearly, indelibly and durably with at least the following information:

- a) name of the manufacturer or its representative in the European Community;
- b) identification of the name, if several models are marketed by the same manufacturer;
- c) year of manufacture.

## **7 Information supplied by the manufacturer**

The energy absorbing system shall be supplied with an explanatory leaflet, and written in at least the official language(s) of the state of destination within the European Community containing at least the following items:

- a) name and address of the manufacturer or its representative in the European Community;
- b) number of this European Standard, i.e. EN 958;
- c) meaning of any marks on the product;
- d) correct use of the product;
- e) how to choose other components for use in the system;
- f) how to maintain/service the product, including a statement/drawing identifying which parts of the energy absorbing system, if any, should be readjusted or replaced after a fall or due to wear and tear;
- g) lifespan of the product or how to assess it and which parts shall be checked and how to check for damage after a fall;
- h) effects of chemical reagents and temperature on the product.

## Annex A (informative)

### Standards on mountaineering equipment

**Table A.1 — List of standards on mountaineering equipment**

No	Document	Title
1	EN 892	Mountaineering equipment — Dynamic mountaineering ropes — Safety requirements and test methods
2	EN 12275	Mountaineering equipment — Connectors — Safety requirements and test methods
3	EN 13089	Mountaineering equipment — Ice-tools — Safety requirements and test methods
4	EN 12277	Mountaineering equipment — Harnesses — Safety requirements and test methods
5	EN 12492	Mountaineering equipment — Helmets for mountaineers — Safety requirements and test methods
6	EN 564	Mountaineering equipment — Accessory cord — Safety requirements and test methods
7	EN 565	Mountaineering equipment — Tape — Safety requirements and test methods
8	EN 566	Mountaineering equipment — Slings — Safety requirements and test methods
9	EN 12276	Mountaineering equipment — Frictional anchors — Safety requirements and test methods
10	EN 12270	Mountaineering equipment — Chocks — Safety requirements and test methods
11	EN 567	Mountaineering equipment — Rope clamps — Safety requirements and test methods
12	EN 958	Mountaineering equipment — Energy absorbing systems for use in klettersteig (via ferrata) climbing — Safety requirements and test methods
13	EN 959	Mountaineering equipment — Rock anchors — Safety requirements and test methods
14	EN 568	Mountaineering equipment — Ice anchors — Safety requirements and test methods
15	EN 569	Mountaineering equipment — Pitons — Safety requirements and test methods
16	EN 893	Mountaineering equipment — Crampons — Safety requirements and test methods
17	prEN 15151	Mountaineering equipment — Descenders — Safety requirements and test methods
18	EN 12278	Mountaineering equipment — Pulleys — Safety requirements and test methods

## Annex ZA (informative)

### Relationship between this European Standard and the Essential Requirements of EU Directive 89/686/EEC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 89/686/EEC on the approximation of the laws of the Member States relating to personal protective equipment.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

**Table ZA.1 — Correspondence between this European Standard and Directive 89/686/EEC**

Clause(s)/sub-clause(s) of this EN	Essential Requirements (ERs) of Directive 89/686/EEC	Qualifying remarks/ Notes
4.2	1.2.1 Absence of risks and other “inherent” nuisance factors	
4.3	1.3.2 Lightness and design strength	
6, 7	1.4 Information supplied by the manufacturer	

**WARNING:** Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

## Bibliography

- [1] EN 12275, *Mountaineering equipment — Connectors — Safety requirements and test methods*

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