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Gorniġka oprema ï Dinamiļno obremenjene gorniġke vrvi - Varnostne zahteve in preskusne metode

Mountaineering equipment - Dynamic mountaineering ropes - Safety requirements and test methods

Bergsteigerausrüstung - Dynamische Bergseile - Sicherheitstechnische Anforderungen und Prüfverfahren

Équipement d'alpinisme et d'escalade - Cordes dynamiques - Exigences de sécurité et méthodes d'essai

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

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Mountaineering equipment - Dynamic mountaineering ropes - Safety requirements and test methods

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This European Standard was approved by CEN on 23 September 2004.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Contents

Foreword

This document (EN 892:2004) 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of an identical text or by endorsement, at the latest by May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

This document supersedes EN 892:1996.

This European Standard 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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

The text is based on UIAA-Standard B (Union Internationale des Associations d'Alpinisme), which has been prepared with international participation.

This document is one of a package of standards for mountaineering equipment, see annex A.

1 Scope

This document specifies safety requirements and test methods for dynamic ropes (single, half and twin ropes) in kernmantel construction for use in mountaineering including climbing.

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.

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
dynamic mountaineering rope
rope, which is capable, when used as a component in the safety chain, of arresting the free fall of a person engaged in mountaineering or climbing with a limited peak force

3.2
single rope
dynamic mountaineering rope, capable of being used singly, as a link in the safety chain, to arrest a person's fall

3.3
half rope
dynamic mountaineering rope, which is capable, when used in pairs, as a link in the safety chain to arrest the leader's fall (see Figure 1)

3.4
twin rope
dynamic mountaineering rope, which is capable, when used in pairs and parallel, as a link in the safety chain to arrest a person's fall (see Figure 2)

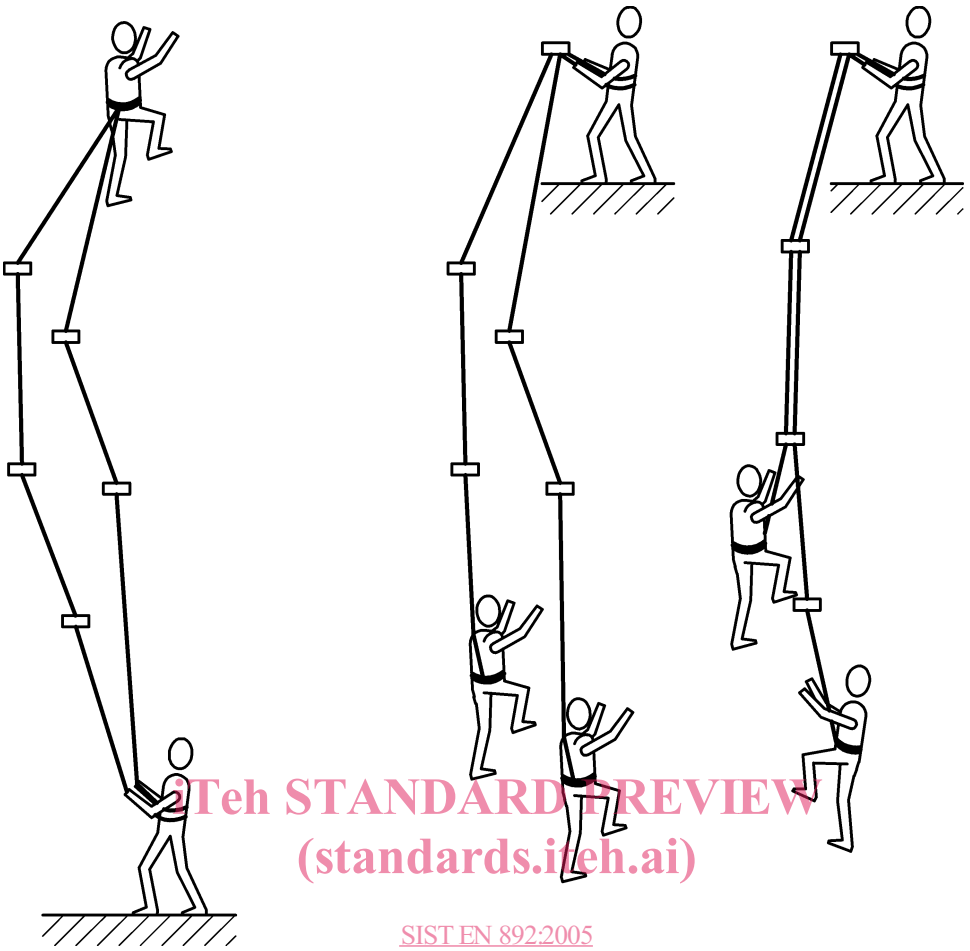


Figure 1 — Examples of use of half ropes

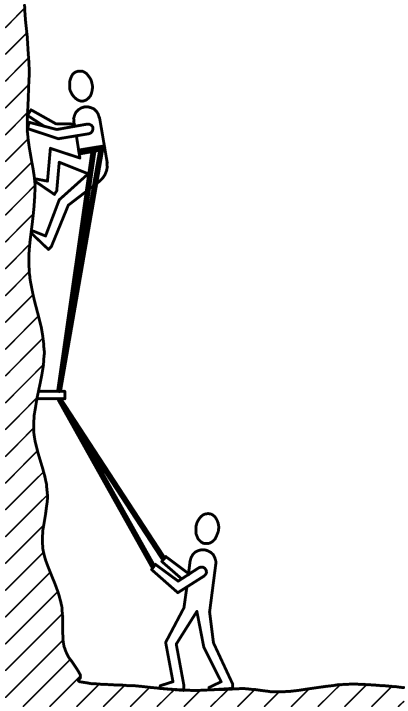


Figure 2 — Use of twin rope

3.5
kernmantel rope
rope composed of a core and a sheath

4 Safety requirements

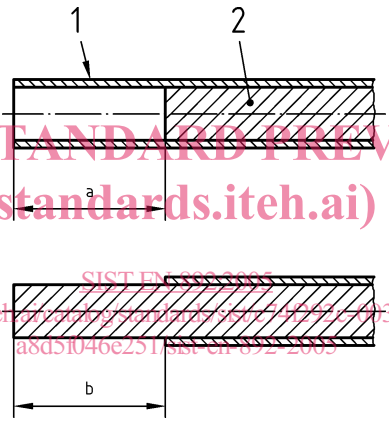
4.1 Construction

Dynamic ropes in accordance with this document shall be made in a kernmantel construction.

If the properties of the rope change along its length, for example: diameter, strength, markings, samples from each section shall be submitted for testing. The information to be supplied shall all correspond to the lowest performance section of the rope.

4.2 Sheath slippage

When tested in accordance with 5.4, the sheath slippage in a longitudinal direction relative to the core (in positive or negative direction) shall not exceed 20 mm (see Figure 3).



Key
1 Sheath
2 Core

[a] Positive sheath slippage ≤ 20 mm
[b] Negative sheath slippage ≤ 20 mm

Figure 3 — Sheath slippage

4.3 Static elongation

When tested in accordance with 5.5, the static elongation shall not exceed:

— 10 % in single ropes (single strand of rope);

— 12 % in half ropes (single strand of rope);

— 10 % in twin ropes (double strand of rope).

4.4 Dynamic elongation

When tested in accordance with 5.6, the dynamic elongation shall not exceed 40 % during the first drop for each test sample.

4.5 Peak force during fall arrest, number of drops

4.5.1 Peak force in the rope

When tested in accordance with 5.6, the peak force in the rope, during the first drop, for each test sample, shall not exceed:

— 12 kN in single ropes (single strand of rope);

— 8 kN in half ropes (single strand of rope);

— 12 kN in twin ropes (double strand of rope).

4.5.2 Number of drops

When tested in accordance with 5.6, each rope sample shall withstand at least 5, for twin ropes at least 12, consecutive drop tests without breaking.

5 Test methods

5.1 Test samples

A test sample with a length of:

— 40 m for single and half ropes;

— 80 m or 2 × 40 m for twin ropes

shall be available for the tests.

Carry out the tests in accordance with 5.3 on an unused test sample.

Carry out the tests in accordance with 5.4 on two unused test samples with a length of (2 250 ± 10) mm.

Carry out the test in accordance with 5.5 on two unused test samples with a length of at least 1 500 mm.

Carry out the tests in accordance with 5.6 on three unused test samples with a minimum length of 5 m for single and half ropes, and 10 m for twin ropes, cut out of the available test sample.

5.2 Conditioning and test conditions

Dry the test samples for at least 24 h in an atmosphere of (50 ± 5) °C and less than 10 % relative humidity. Subsequently, cool the samples in an atmosphere of (20 ± 2) °C and not more than 65 % relative humidity for 2 h. Then condition these test samples in an atmosphere of (20 ± 2) °C and (65 ± 2) % relative humidity for at least 72 h. Then test these samples at a temperature of (23 ± 5) °C.

5.3 Construction, diameter, and mass per unit length

5.3.1 Procedure

Clamp the test sample at one end.

Load the test sample without shock with a mass[1] of:

— (10 ± 0,1) kg for single ropes;

— (6 ± 0,1) kg for half ropes;

— (5 ± 0,1) kg for twin ropes

at a distance of at least 1 200 mm from the clamp.

After applying the load for 60 s mark within the next 10 s a reference length of (1 000 ± 1) mm on the test sample. The distance of the marking from the clamp or attachment for the test sample shall be at least 50 mm.

Within a further 3 min measure the diameter in two directions around the diameter starting at points 90° apart at each of three levels approximately 100 mm apart. The length of the contact areas of the measuring instrument shall be (50 ± 1) mm. The rope cross-sectional area shall not be subject to any compression during the measurement.

Then cut out the marked portion of the test sample and determine the mass to the nearest 0,1 g.

Check that the construction of the rope is a kernmantel construction.

5.3.2 Expression of results

Express the diameter as the arithmetic mean of the six measurements to the nearest 0,1 mm.

Express the mass per unit length in ktex or g/m to the nearest 1 g.

5.4 Sheath slippage

5.4.1 Principle

The rope is drawn through the apparatus illustrated in Figure 4, where the movement is restricted by radial forces. The resulting frictional force on the sheath causes slippage of the sheath relative to the core. The extent of this slippage is measured.

1) The mass can be introduced by a corresponding force.