SLOVENSKI STANDARD

SIST EN 568:1998

01-september-1998

Gorniška oprema – Ledni vijaki – Varnostne zahteve in preskusne metode

Mountaineering equipment - Ice anchors - Safety requirements and test methods

Bergsteigerausrüstung - Verankerungsmittel im Eis - Sicherheitstechnische Anforderungen und Prüfverfahren

Equipement d'alpinisme et d'escalade - Broche a glace - Exigences de sécurité et méthodes d'essai

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ICS:

97.220.40

SIST EN 568:1998 **en**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 568

February 1997

ICS 97.220.40

Supersedes EN 568:1992

Descriptors: sport equipment, mountaineering, ice anchors, safety, specifications, tests, inspection, wear resistance, break strength, marking

English version

Mountaineering equipment - Ice anchors - Safety requirements and test methods

Equipement d'alpinisme et d'escalade - Broche à glace - Exigences de sécurité et méthodes d'essai

Bergsteigerausrüstung - Verankerungsmittel im Eis - Sicherheitstechnische Anforderungen und Prüfverfahren

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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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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart,36 B-1050 Brussels

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Ref. No. EN 568:1997 E

Foreword

This European Standard 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 supersedes EN 568:1992.

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

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

Annexes A and ZA of this European Standard are informative.

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of an identical text or by endorsement, at the latest by August 1997, and conflicting national standards shall be withdrawn at the latest by August 1997.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 89/686/EEC.

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

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies safety requirements and test methods for ice anchors, i. e. ice screws and ice pitons for use in mountaineering including climbing.

2 Definitions

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

2.1 ice screw: Anchor which is screwed into the ice and is screwed out again after use.

2.2 ice piton: Anchor which is hammered into the ice and is removed again after use.

2.3 placement length, *l*: The length of the anchor from its end to the part of the eye/connector hole intended for being in contact with the ice after it has been screwed or hammered in (see figure 1).

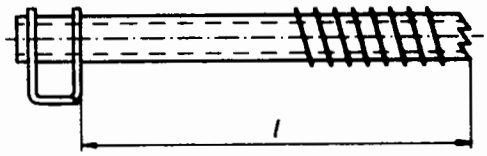

Figure 1: Placement length (*l*)

2.4 initial torque: Maximum torque necessary for achieving the first revolution of the ice screw.

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3 Safety requirements

3.1 Design

3.1.1 Ice screws shall consist of a cylindrical or semi-cylindrical hollow body with thread. At the screw head, there is an eye into which a connector can be clipped.

Ice pitons shall consist of a cylindrical or semi-cylindrical hollow body and have an eye into which a connector can be clipped.

3.1.2 The head and eye shall be free of burrs. The inside edges of the eye shall be either bevelled to at least 0,2 mm × 45° (see figure 2) or be rounded with a radius of at least 0,2 mm (see figure 3).

Dimensions in millimetres

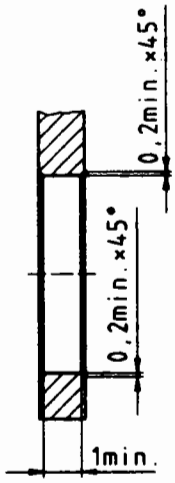

Figure 2: Bevelled inside edges

Dimensions in millimetres

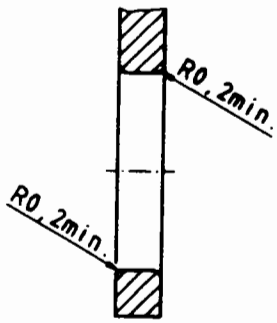

Figure 3: Rounded inside edges

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3.1.3 When tested in accordance with 4.1, the clearance of the eye shall be at least 15 mm.

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3.2 Wear resistance of ice pitons

When tested in accordance with 4.2.4.1, ice pitons shall not show any deformation likely to affect safety e. g. cracks, or separation of components. The impact area of the head shall remain sufficiently intact so as to allow further hammering.

NOTE: Mushrooming, as occurs with chisels, is not considered detrimental.

3.3 Screwability of the ice screws

When tested in accordance with 4.2.4.2, ice screws shall produce a torque 50 % greater than the initial torque, after a maximum of 30 turns.

3.4 Resistance to fracture and holding power

When tested in accordance with 4.2.4.3, anchors shall withstand a force of at least 10 kN in the radial direction, without being pulled out of the ice or breaking.

NOTE: Permanent deformation can occur during the test.

4 Test methods

4.1 Examination of design

Test the requirements of 3.1 by tactile and visual examination and measurement. Check the clearance of the eye with a bar of a diameter of $(15\ ^{+0,01}_{0})$ mm.

4.2 Determination of wear resistance of ice pitons, screwability of ice screws and resistance to fracture and holding power of ice anchors

4.2.1 Test samples

Carry out the test on three ice screws or four ice pitons.

Use one test sample for the test according to 4.2.4.1 and three test samples each for the tests according to 4.2.4.2 and 4.2.4.3.

If anchors of different length, but otherwise same design, are available, test the one with the largest placement length in the tests according to 4.2.4.1 and the one with the shortest according to 4.2.4.3.

NOTE: After being tested according to 4.2.4.2, the ice screws can still be used for the test according to 4.2.4.3.

4.2.2 Apparatus

4.2.2.1 Ice blocks

4.2.2.2 Steel ice container of the following dimensions:

minimum length	350 mm	} internal dimensions
minimum width	220 mm	
minimum depth	330 mm	
minimum wall thickness	6 mm	

The base of the ice container shall be rigid so that it does not influence the test results.

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4.2.2.3 A vertically guided falling body of mass (10 ± 0,002) kg and an impact area of hardness, HV 40 = 800 ± 10 %, for testing ice pitons.

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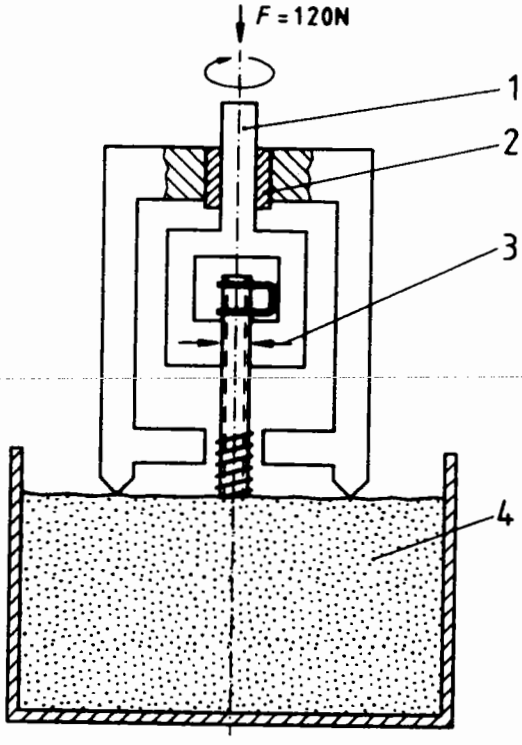
4.2.2.4 A device to hold a shaft at right angles to the ice surface, the lower end of the shaft having a clamping mechanism for an ice screw, which holds the screw concentrically. A lever with a torque gauge is fitted to the top of the shaft for screwing in the ice screw (see figure 4).



1 rotatable shaft
2 guide
3 radial clamp
4 ice

Figure 4: Device for testing the screwability of ice screws

4.2.3 Preparation of ice blocks

4.2.3.1 Type 1: Fill the ice container with water and store it at a temperature of $(-10 \pm 1)^{\circ}$ C for 20 h. Smooth off any uneven surface of the ice.

4.2.3.2 Type 2: Fill the ice container alternately with 50 mm deep layers of ice grains of maximum diameter 10 mm and at a temperature of $(-8 \pm 2)^{\circ}$ C, and 250 ml of cold potable water. When the ice container is full, load the ice for (5 ± 0,5) min with a steel plate of mass (100 ± 2) kg, the clearance between the steel plate and the side walls of the container not exceeding 10 mm.

4.2.4 Procedure

4.2.4.1 Determination of wear resistance of ice pitons when hammered in

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Carry out the test at a temperature of $(-10 \pm 3)^{\circ}$ C. Drive the ice piton into an ice block of type 1, using a vertically guided falling body.

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For the first impact, fix the height of drop at (375 ± 5) mm above the impact surface of the ice piton.

For each successive impact, increase the height of drop by the amount the piton has penetrated the ice.

Hammer in the ice piton until the lower edge of the eye is in contact with the surface of the ice.

Repeat the procedure, inserting and removing the piton from the ice 100 times, without removing the ice core by hand between the individual placements.

NOTE: The piton can be placed in the same ice block several times, providing the placements are at least 75 mm apart.

4.2.4.2 Determination of screwability of ice screws

Fix the ice screw concentrically to the shaft of the holding device by means of the clamp. Store the ice screw and test device at (−10 ± 1)° C for a minimum of 4 h.

Place the ice screw on the surface of a type 1 ice block and adjust the holding device to keep the ice screw at right angle to the ice surface.

Screw in the ice srew with a continous contact force of (120 ± 3) N, and measure in the initial torque.

After a maximum of 30 turns, take measurements to assess the increase in torque by 50 %.

Complete the test within 5 min of removal from the conditioning atmosphere.

All test specimens shall meet the requirement.

4.2.4.3 Determination of resistance to fracture and holding power of ice anchors

Insert the ice anchor in the middle of the surface of a type 2 ice block at an angle of (90 ± 5)°. Smooth the ice surface around the anchor and store the ice block and test sample at a temperature of (−18 ± 1) °C for 20 h.

Apply a load to the ice anchor parallel to the ice surface (see figure 5), at a rate of (100 ± 10) mm/s until the ice anchor fails or is pulled out of the ice block. Complete the test within 3 min of removal from the conditioning atmosphere.

All test samples shall meet the requirement.

Dimensions in millimetres

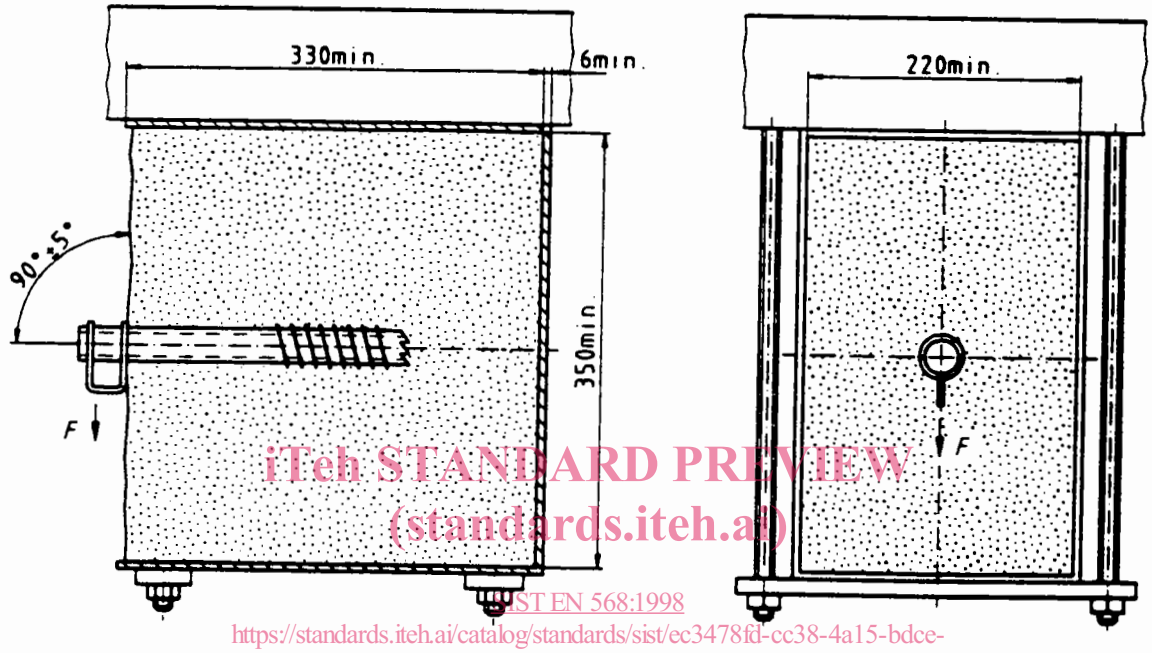

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Figure 5: Test for the holding power