SLOVENSKI STANDARD

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Gorniška oprema - Sidra za skalo - Varnostne zahteve in preskusne metode

Mountaineering equipment - Rock anchors - Safety requirements and test methods

Bergsteigerausrüstung - Bohrhaken - Sicherheitstechnische Anforderungen und Prüfverfahren

Equipement d'alpinisme et d'escalade - Amarrages pour rocher - Exigences de sécurité et méthodes d'essai

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English Version

Mountaineering equipment - Rock anchors - Safety requirements and test methods

Equipement d'alpinisme et d'escalade - Amarrages pour rocher - Exigences de sécurité et méthodes d'essai

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This European Standard was approved by CEN on 10 May 2007.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 959:2007) has been prepared by Technical Committee CEN/TC 136 “Sports, playground and other recreational equipment”, the secretariat of which is held by DIN.

This document supersedes EN 959:1996.

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of an identical text or by endorsement, at the latest by December 2007, and conflicting national standards shall be withdrawn at the latest by December 2007.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, 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 document is based on the former UIAA-Standard P (Union Internationale des Associations d'Alpinisme), which has been prepared with international participation.

This 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 rock anchors 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.

EN 12275:1998, *Mountaineering equipment — Connectors — Safety requirements and test methods*

ISO 1920-3, *Testing of concrete - Part 3: Making and curing test specimens*

3 Terms and definitions

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

3.1
rock anchor
anchoring device intended for repeated use after installation, that is inserted into a drilled hole in the rock and held in place by gluing, or expansion forces, or positive locking, and with an attachment point for a connector (in accordance with 3.1 of EN 12275:1998)

3.2
body of the rock anchor
part of the rock anchor that will be installed in the rock

3.3
hanger
attachment point capable of being separated from the body of a rock anchor

3.4
installed length
distance from the rock surface to the furthest point of the body in mechanical contact with the rock or bonded to the rock, after installation

4 Safety requirements

4.1 Materials

All parts of a rock anchor shall be manufactured from the same material.

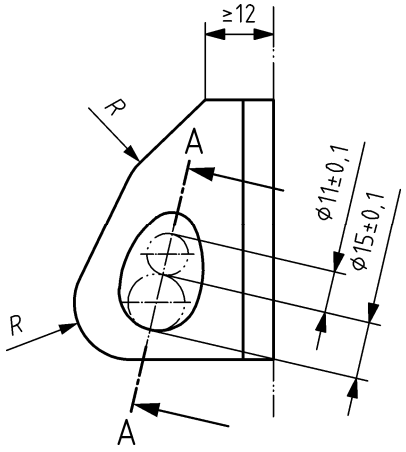
NOTE Depending on environmental factors, rock anchors are potentially liable to suffer from corrosion. Information on the choice of materials and the need for inspection and maintenance is given in Annex B.

4.2 Design

4.2.1 The overall thickness of the border of the eye shall be 3 mm. If the edges are bevelled, the remaining inner surface shall have a minimum width of 2 mm.

4.2.2 All corners that will be more than 12 mm from the rock surface shall be rounded to a radius R of a minimum 10 mm (see Figure 1).

Dimensions in millimetres

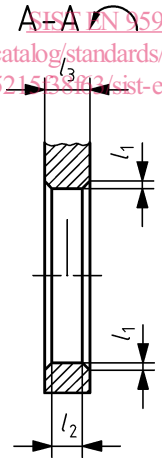


Key
R minimum 10 mm

NOTE A-A see Figure 2

Figure 1 — Clear width and external shape of the eye

4.2.3 All edges that can be handled after placement of the rock anchor in the rock shall be rounded to a radius R of minimum 0,2 mm or bevelled to a minimum of 0,2 mm × 45 ° (see Figure 2). This applies to inner and outer edges.



Key
l_1 minimum 0,2 mm × 45 °
l_2 minimum 2 mm
l_3 minimum 3 mm

Figure 2 — Internal edges of the eye

4.2.4 After inserting the rock anchor in the concrete block, the eye shall be wide enough to accommodate two pins, one with a diameter of (15 ± 0,1) mm for the lower part and one with a diameter of (11 ± 0,1) mm for the upper part (see Figure 1).

4.2.5 In case of expansion-type rock anchors the expansion shall not be dependent on contact with the bottom of the drilled hole.

4.2.6 For glued-in rock anchors, the installed length shall be 70 mm minimum.

For mechanical rock anchors, the installed length shall be at least five times the diameter of the drilled hole (in accordance with the manufacturer's instructions).

NOTE For installation in rock softer rather than the concrete test block, a longer length can be necessary to achieve the required load bearing capacity. Further information is given in Annex C.

4.3 Loadbearing capacity

4.3.1 Axial loadbearing capacity

When tested in accordance with 5.3.2.2, the rock anchor shall withstand an axial load of 15 kN, without being pulled out of the concrete block or breaking.

Permanent deformation is permissible.

4.3.2 Radial loadbearing capacity

When tested in accordance with 5.3.2.3, the rock anchor shall withstand a radial load of 25 kN, without being pulled out of the concrete block or breaking.

Permanent deformation is permissible.

5 Test methods

5.1 Check of materials

The manufacturer shall confirm that the requirements of 4.1 are met.

5.2 Apparatus

5.2.1 Tensile testing machine

5.2.2 Concrete block with minimum dimensions of 200 mm × 200 mm × 200 mm and a compressive strength of (50 ± 10) N/mm^2.

The maximum grain size of the aggregate shall not exceed 16 mm.

The compressive strength of the concrete block shall be verified on three test samples produced as specified in ISO 1920-3.

NOTE All concrete testing centres produce these types of concrete blocks to order.

5.3 Procedure

5.3.1 Examination of design

Ensure by visual examination and check the dimensions that the specifications in accordance with 4.2.1 to 4.2.6 are met.