Mountaineering equipment — Ice tools — Safety requirements and test methods

The European Standard EN 13089:1999 has the status of a British Standard

ICS 97.220.40

National foreword

This British Standard is the English language version of EN 13089:1999.

The UK participation in its preparation was entrusted by Technical Committee SW/136, Sports, playground and other recreational equipment, to Subcommittee SW/136/5, Mountaineering equipment, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 14, an inside back cover and a back cover.

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English version

Mountaineering equipment — Ice-tools — Safety requirements and test methods

Equipements d'alpinisme et d'escalade — Outils à glace — Exigences de sécurite et méthodes d'essai

Bergsteigerausrüstung — Eisgeräte — Sicherheitstechnische Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 7 June 1999.

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.

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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EUROPÄISCHES KOMITEE FÜR NORMUNG
Central Secretariat: rue de Stassart 36, B-1050 Brussels

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Contents

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 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2000, and conflicting national standards shall be withdrawn at the latest by January 2000.

The text is based on UIAA-Standard C (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.

Annex A of this European Standard is informative.

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

1 Scope

This standard specifies safety requirements and test methods for ice-tools for use in mountaineering including climbing.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 565
Mountaineering equipment – Tape – Safety requirements and test methods

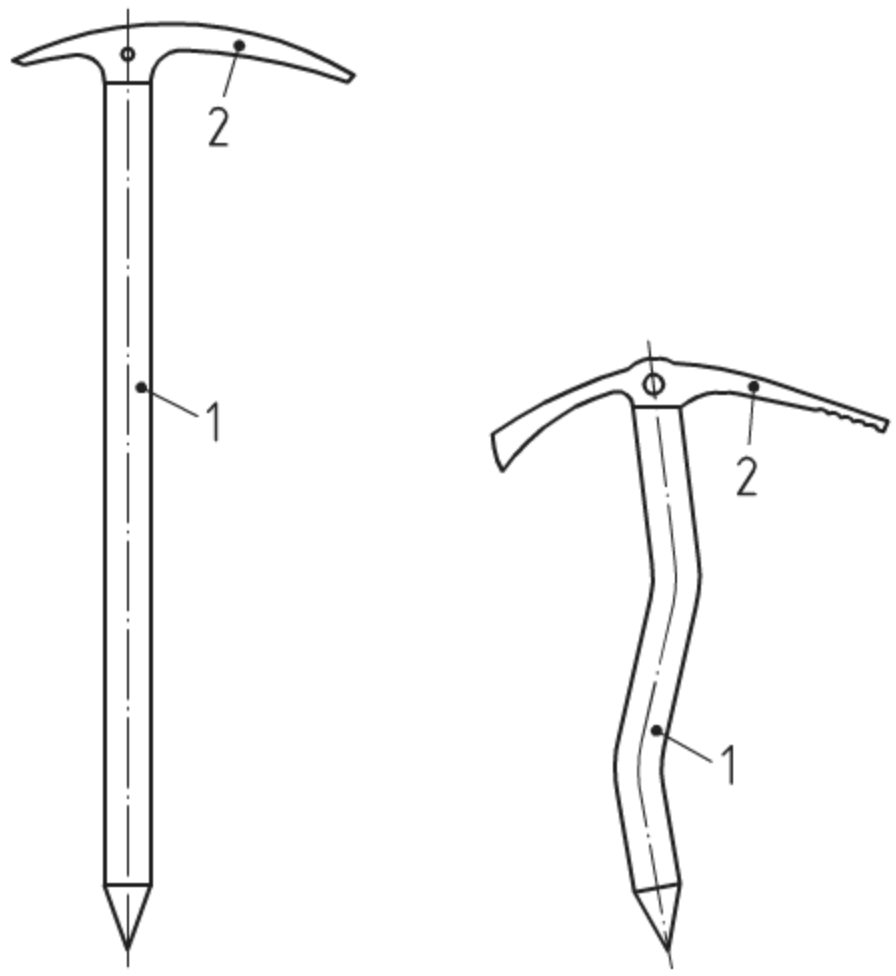
3 Definitions

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

3.1 ice-tool: Hand held tool intended for movement on snow and/or ice which can be used as an anchor point. It comprises at least a shaft and a pick (see figure 1).

3.2 technical ice-tool (type T): Ice-tool intended for use when climbing steep ice.

3.3 basic ice-tool (type B): Ice-tools other than technical ice-tools.



1 Shaft of the ice-tool
2 Pick of the ice-tool

Figure 1: Main parts of an ice-tool

4 Safety requirements

4.1 General

Unless otherwise stated, the following requirements apply to both types of ice-tools.

4.2 Edges

All edges of the ice-tool with which the user's hands can come into contact shall be free from burrs.

4.3 Shaft strength

When tested in accordance with 5.3.3, on removal of the load from the shaft the permanent deformation at the point of application of the load shall not exceed 3 mm or the calculated f_K value.

4.4 Strength in the load direction YY

When tested in the load direction YY (see figure 2) in accordance with 5.3.4,

a) the test sample shall not break;

b) no component part of the test sample shall work loose.

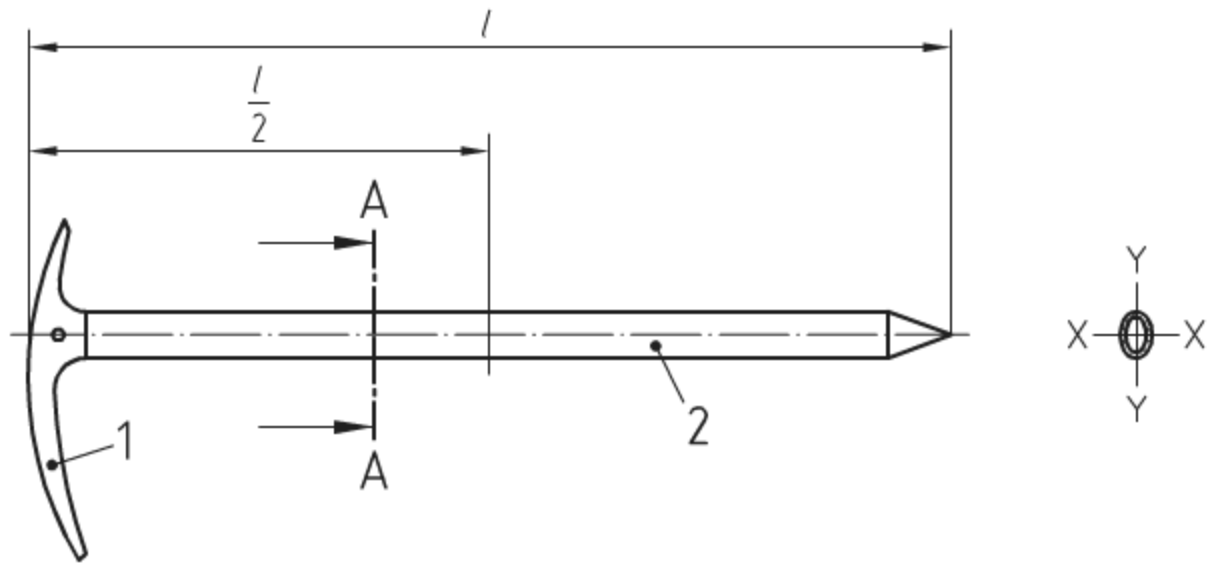
4.5 Strength in the load direction XX

When tested in the load direction XX (see figure 2) in accordance with 5.3.5,

a) the shaft shall not break;

b) no component part of the test sample shall work loose;

c) the permanent deformation at the point of application of the load shall not exceed 10 mm after removal of the load.



1 Pick
2 Shaft
XX/YY Load directions

Figure 2: Load directions XX and YY

4.6 Flat pick strength

When tested in accordance with 5.3.6,

a) the test sample shall not break;

b) no component part of the test sample shall work loose;

c) the permanent deformation at the point of application of the force shall not exceed 70 mm or the calculated f_K value after removal of the force.

4.7 Fatigue performance of type T ice-tool picks

4.7.1 Flat picks

When tested in accordance with 5.3.7.1,

a) the test sample shall not break;

b) no component part of the pick shall work loose.

4.7.2 Circular and semicircular picks

When tested in accordance with 5.3.7.2,

a) the test sample shall not break;

b) no component part of the pick shall work loose.

5 Test methods

5.1 Preparation of test samples

For the strength tests 5.3.3 to 5.3.6 the test samples shall be conditioned for at least 1 h at (- 30 ± 5) °C. The tests shall be carried out at (23 ± 5) °C. Each test shall begin within 3 min from removal from conditioning.

5.2 Apparatus

For the tests 5.3.3 to 5.3.6 use a tape in accordance with EN 565 with a width of (15 ± 2) mm.

5.3 Procedure

5.3.1 Test sample

Carry out each test on a test sample not previously subjected to any load.

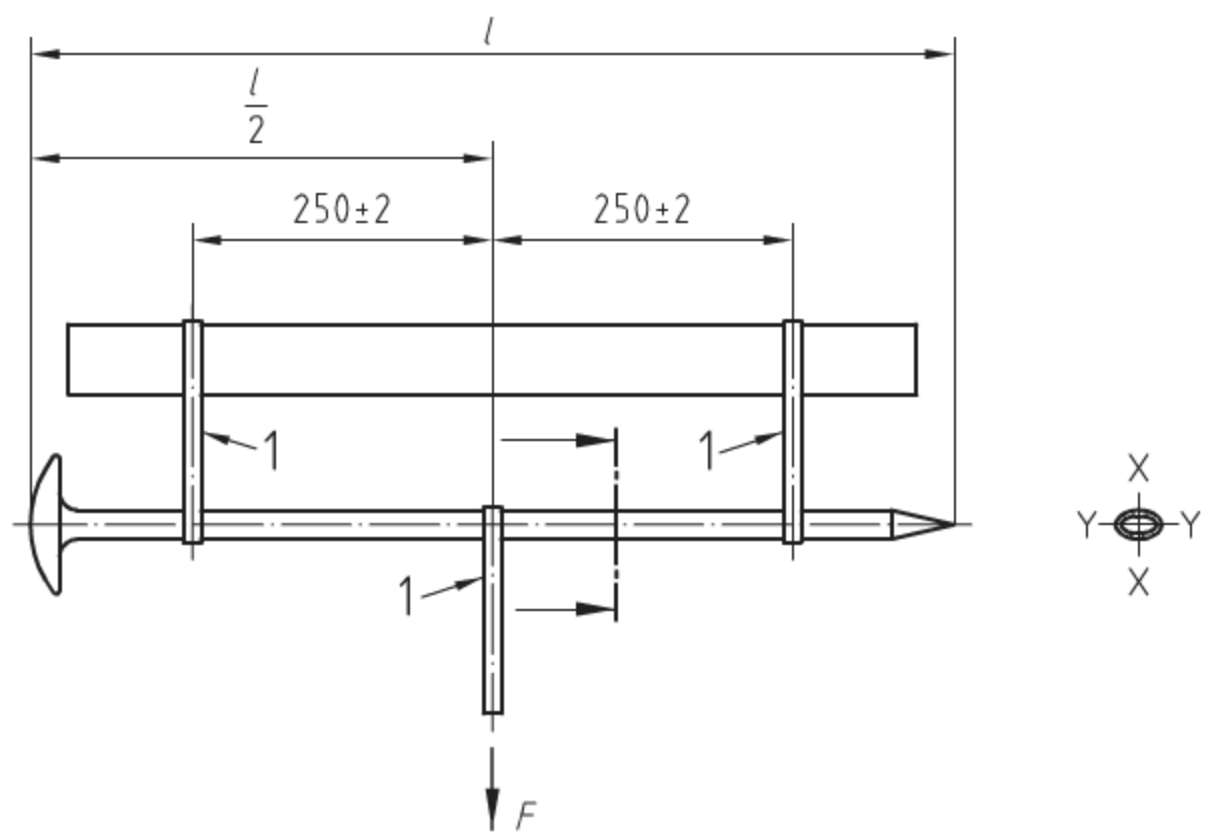
5.3.2 Edges

Check by visual and tactile examination that the requirements of 4.2 are met.

5.3.3 Shaft strength

Support the shaft horizontally and load it in the direction XX as shown in figure 3.

Dimensions in millimetres



1 Tape

Figure 3: Testing of shaft strength

If the ice-tool is long enough, arrange the tapes as shown in figure 3 with the load applied at the mid length of the ice-tool.

Apply a force of

F = (2 500 + 125/- 0) N for type B ice-tools,

F = (3 500 + 175/- 0) N for type T ice-tools,

without shock and maintain for (60 ± 5) s.

If the ice tool is not long enough, reduce the 250 mm to "l_k". Then calculate the force F_k to be applied as follows:

$$F_k = F \times 250/l_k$$

Calculate the maximum permissible permanent deformation f_k in mm as follows:

$$f_k = 3 \times (l_k/250)^2$$

where

l_k is the distance in mm from the middle of the shaft to the middle of the outer tapes, being positioned at the ends of the shaft

During the test, according to the shape of the shaft, the ice-tool may turn. If so, carry out the test in the stable position attained after rotation. For a straight shaft rotation shall be prevented.

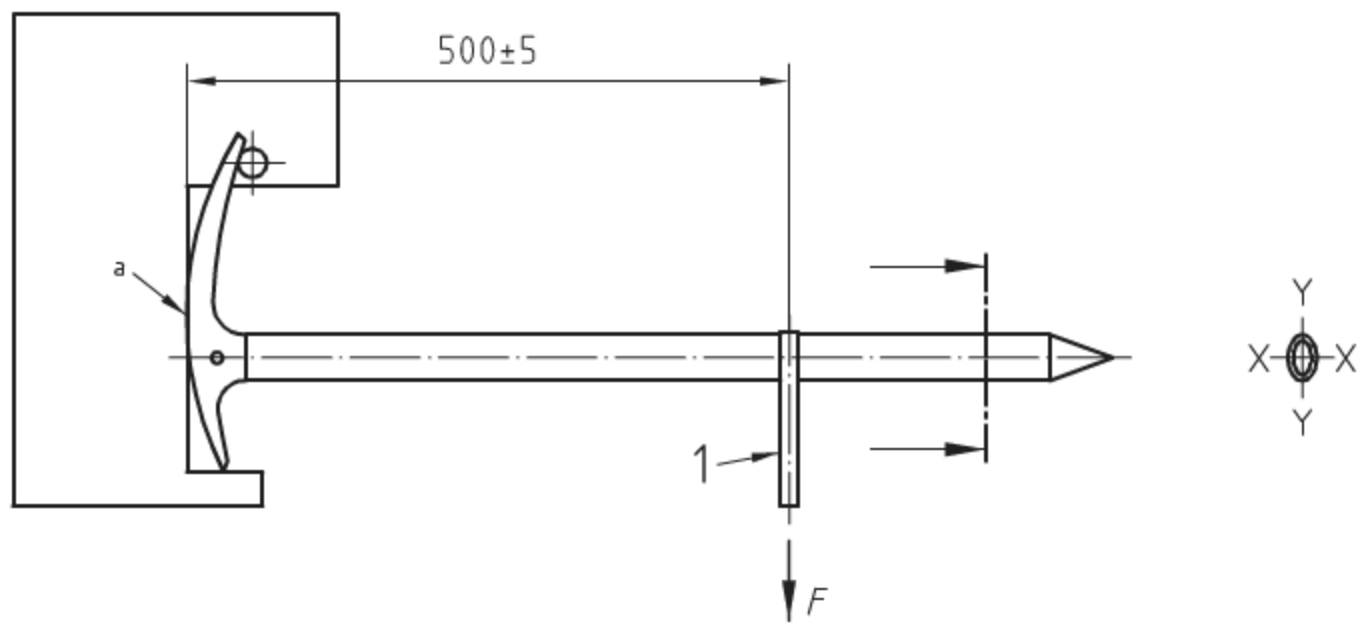
If the ice-tool is fitted with a telescopic shaft, carry out the test at the length stated in the manufacturer's instructions for use as an anchor point for belaying in snow.

5.3.4 Strength in the load direction YY

Support and load the test samples as shown in figure 4.

Figure 4)

Dimensions in millimetres



1 Tape
a Point K

Figure 4: Testing of strength in the load direction YY

If the ice-tool is long enough, arrange a tape as shown in figure 4 with the force appplied at 500 mm from point K in the direction YY.

Apply a force of

F = (600 + 30/- 0) N for type B ice-tool,

F = (900 + 45/- 0) N for type T ice-tool,

without shock and maintain for (60 ± 5) s.

If the ice-tool is not long enough reduce the 500 mm to l_k. Then calculate the force F_k to be applied as follows:

$F_k = F \times 500/l_k$.

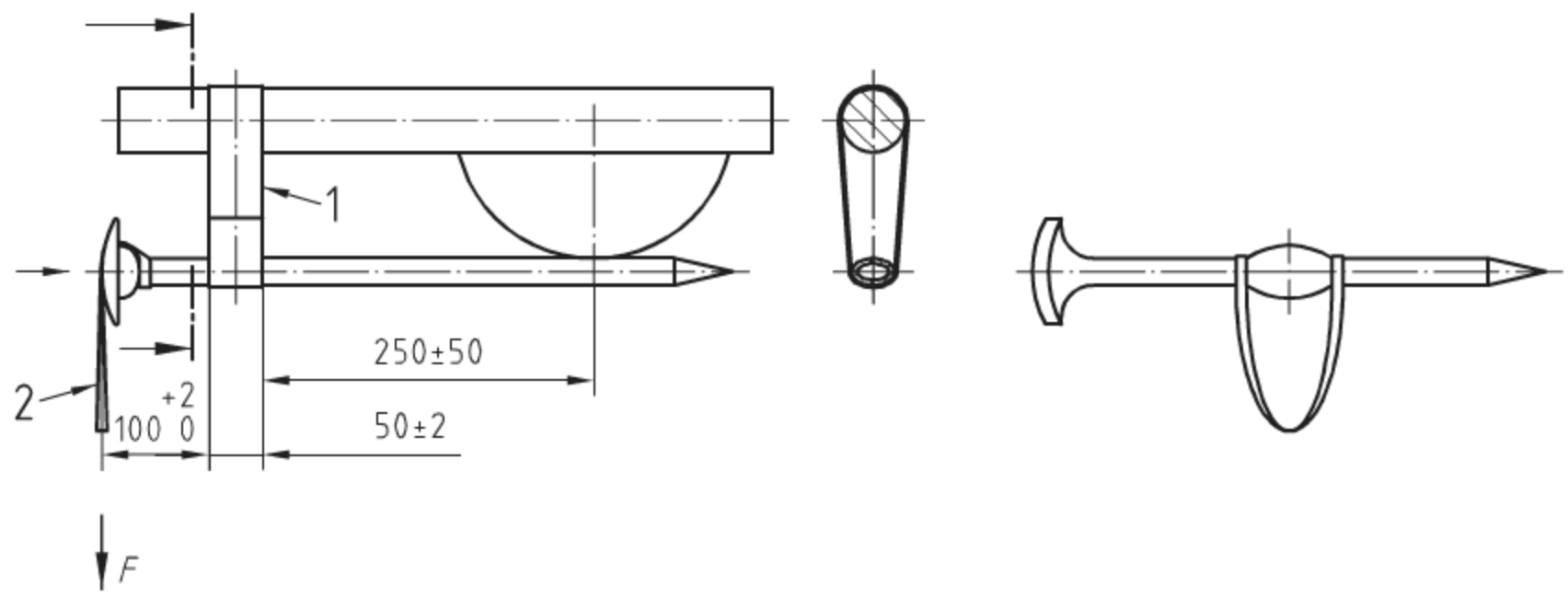
where

l_k is the distance in mm from point K to the middle of the tape, being positioned at the end of the shaft.

5.3.5 Strength in the load direction XX

Support the test sample by means of a tape loop and a rounded stop as shown in figure 5, so that the ice-tool pick lies normal to the direction of the applied force. Ensure that rotation of the test sample is prevented.

Dimensions in millimetres



1 tape loop of 50 mm width
2 tape

Figure 5: Testing of the strength in the load direction XX

The line of application of the force shall be at $(100\ ^{+\ 2}_{\ 0})$ mm from the nearest edge of the supporting tape (see figure 5).

Apply a force of

F = (2 500 + 125/- 0) N for type B ice-tools,

F = (4 000 + 200/- 0) N for type T ice-tools,

without shock and maintain for (60 ± 5) s.

5.3.6 Flat pick strength

Clamp the test sample in accordance with 5.3.7.1.

Apply without shock a moment of

T = (42 + 2,1/- 0) Nm for type B ice-tools,

T = (60 + 3/-0) Nm for type T ice-tools,

on a test sample with a lever length of $(330\ ^{+\ 3}_{\ 0})$ mm and maintain for (60 ± 5) s.

If a lever of length 330 mm is not achievable, use the longest possible lever length, l_K.

Measure the permanent deformation at the point of application of the force. If the lever length of 330 mm is not achievable, calculate the maximum permissible permanent deformation f_k in mm as follows:

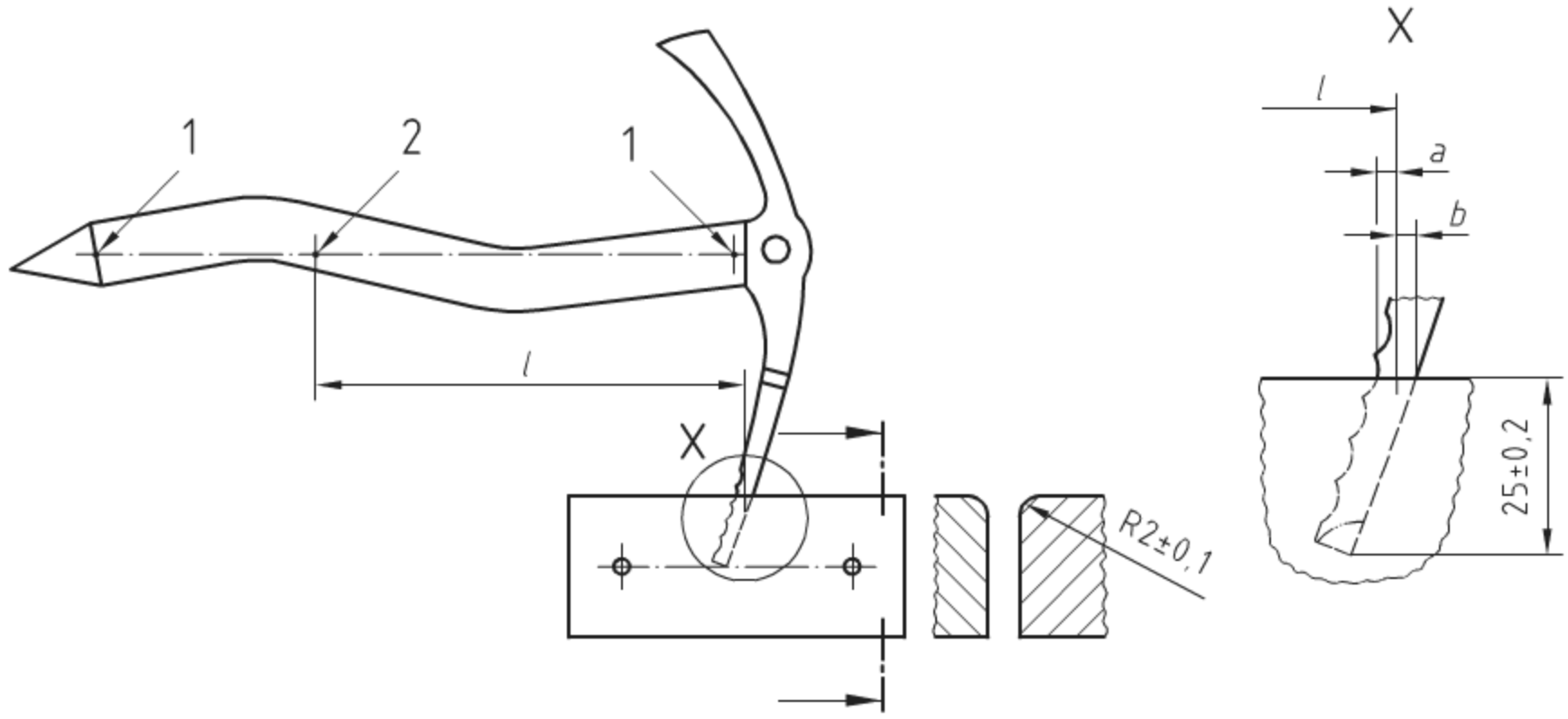
$$f_K = \frac{70\,(l_k)}{330} \quad 1$$

5.3.7 Fatigue performance

5.3.7.1 Flat picks

Clamp the test sample between two vice jaws with a hardness greater than that of the test sample, with an edge radius of (2 ± 0,1) mm and a depth of (25 ± 0,2) mm as shown in figure 6.

Dimensions in millimetres



1 Mid points of the ends of the shaft
2 Point of application of the load
a = *b*

Figure 6: Clamping of flat pick

Set the shaft such that a line drawn between the mid-points of the ends of the shaft is parallel to the upper edges of the vice jaws.

Apply a cyclic force with an amplitude of (80^{+5}_{0}) N in a plane parallel to the outer edges of the vice jaws on both sides with a lever length of (250 ± 1) mm. The frequency shall be between 0,5 Hz and 2 Hz.

The number of load cycles shall be 50 000.

5.3.7.2 Circular and semicircular picks

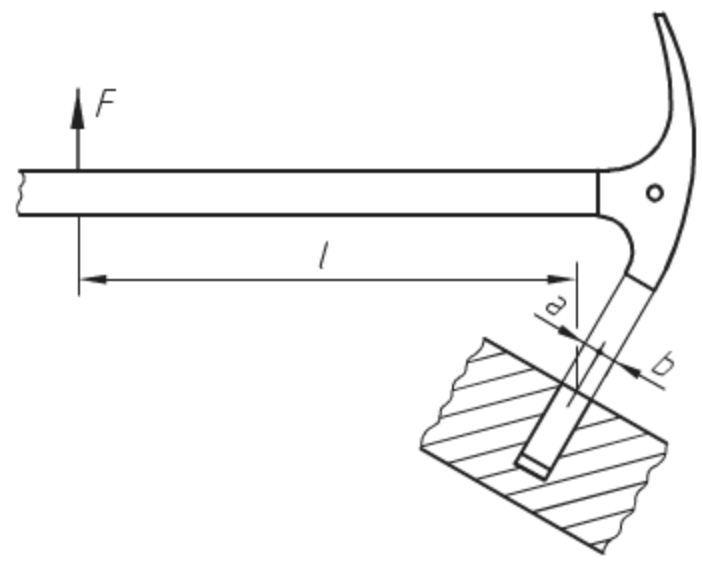
Clamp the test samples according to figures 7 to 9 for semicircular picks.

Clamp the test sample at a depth of (25 ± 0,2) mm between two vice jaws with a hardness greater than the test sample suitable for the shape of the pick, consisting principally of a concave and convex form, and apply a clamping force to the upper half of the cross-sectional area of the pick.

Apply a cyclic force *F* varying between 0 and (80^{+5}_{0}) N (on one side only, in accordance with figure 7) in the load direction YY with a lever length of (250 ± 1) mm.

The frequency shall be between 0,5 Hz and 2 Hz.

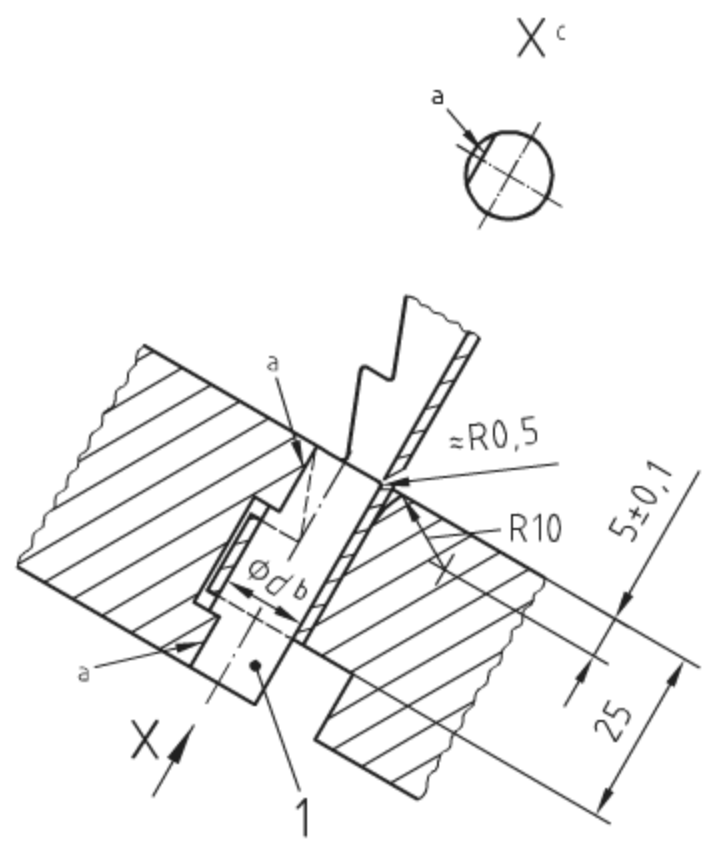
The number of load cycles shall be 12 000.



$a = b$

Figure 7: Clamping of semicircular and circular picks

Dimensions in millimetres



1 Round steel
a Polished surface for counter pressure of jaws
b Internal diameter of the jaws
c Round steel shown without clamping device

Figure 8: Clamping of circular picks

Dimensions in millimetres

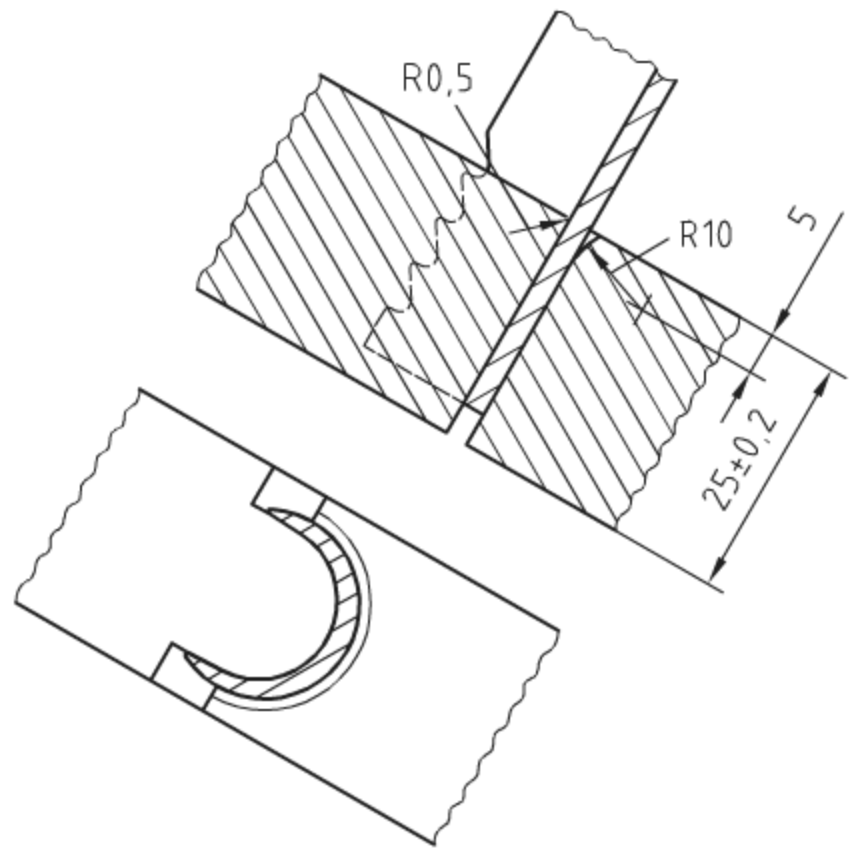


Figure 9: Clamping of semicircular picks

6 Information to be supplied

a) the name or trademark of the manufacturer, importer or supplier;

b) the number of this standard: EN 13089;

c) the meaning of any markings on the product;

d) the use of the product;

e) how to choose other components for use in the system;

f) how to maintain and service the product;

g) the lifespan of the product;

h) the effects of chemical reagents and temperature on the product.

7 Marking

Ice-tools shall be marked clearly, indelibly and durably with at least the following information:

a) the name or trademark of the manufacturer, importer or supplier;

b) the category to which the ice-tool belongs in accordance with 3.1:

– a "B" surrounded by a circle of minimum 10 mm for basic ice-tools;
– a "T" surrounded by a circle of minimum 10 mm for technical ice-tools.

c) If a type B pick is used in an interchangeable system the pick shall be marked with a B, surrounded by a circle of minimum 10 mm.

Annex A (informative)

Bibliography

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	prEN 12492	Mountaineering equipment – Helmets – 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	prEN 893	Mountaineering equipment – Crampons – Safety requirements and test methods
17	[1)]	Mountaineering equipment – Descenders – Safety requirements and test methods (00136079)
18	EN 12278	Mountaineering equipment – Pulleys – Safety requirements and test methods

[1)] in preparation

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