



SLOVENSKI STANDARD
SIST EN 13087-3:2000

01-september-2000

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Protective helmets - Test methods - Part 3: Resistance to penetration

Schutzhelme - Prüfverfahren - Teil 3: Durchdringungsfestigkeit

Casques de protection - Méthodes d'essai - Partie 3: Résistance à la pénétration

Ta slovenski standard je istoveten z: EN 13087-3:2000

[SIST EN 13087-3:2000](https://standards.iteh.ai/catalog/standards/sist/2b5b38c1-2e15-4700-94aa-0bf557978191/sist-en-13087-3-2000)

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ICS:

13.340.20 Varovalna oprema za glavo Head protective equipment

SIST EN 13087-3:2000

en

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ICS 13.340.20

English version

Protective helmets - Test methods - Part 3: Resistance to penetration

Casques de protection - Méthodes d'essai - Partie 3:
Résistance à la pénétration

Schutzhelme - Prüfverfahren - Teil 3:
Durchdringungsfestigkeit

This European Standard was approved by CEN on 14 January 2000.

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.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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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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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 158 "Head protection", the secretariat of which is held by BSI.

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 September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

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(s).

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard is the third Part of EN 13087, which supports essential requirements of EU Directive(s), and consists of ten Parts as follows:-

Part 1 : Conditions and conditioning

Part 2 : Shock absorption

Part 3 : Resistance to penetration

Part 4 : Retention system effectiveness

Part 5 : Retention system strength

Part 6 : Field of vision

Part 7 : Flame resistance

Part 8 : Electrical properties

Part 9 : Mechanical rigidity

Part 10 : Resistance to radiant heat

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Introduction

This standard is intended as a supplement to the specific product standards for protective helmets (helmet standards). This method or other test methods may be applicable to complete helmets or parts thereof, and may be referenced in the appropriate helmet standards.

Performance requirements are given in the appropriate helmet standard, as are such prerequisites as the number of samples, preconditioning, preparation of samples for the tests, sequence and duration of testing and assessment of test results. If deviations from the test method given in this standard are necessary, these deviations will be specified in the appropriate helmet standard.

1 Scope

This European Standard describes methods of test for protective helmets. The purpose of these tests is to enable assessment of the performance of the helmet as specified in the appropriate helmet standard.

This European Standard specifies the method of test for resistance to penetration.

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 (including amendments).

EN 13087-1 Protective Helmets - Test Methods - Part 1 : Conditions and conditioning

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions used in this standard may be found in the appropriate helmet standard.

4 Prerequisites

In order to implement this European Standard, at least the following parameters shall be specified in the appropriate helmet standard:

- a) performance requirements
- b) number of samples
- c) preparation of samples
- d) sequence of conditioning
- e) sequence of tests
- f) type of striker
- g) number and location of impact points on helmet
- h) impact energy, including tolerance, of the striker for each impact.
- i) fitting instructions

5 Test methods

5.1 General

Testing shall be performed in the ambient conditions specified in EN 13087-1. When the test method specifies that the helmet shall be fitted to a headform, this shall be done in accordance with the appropriate helmet standard. Annex A refers to the uncertainty of measurement.

5.2 Principle

A test striker is allowed to fall with specified energy on to a helmet which is fitted to a rigidly mounted test block. Note is taken of whether or not contact is made between the striker and the test block.

5.3 Apparatus

5.3.1 Base

The base shall be solid, made of steel or a combination of steel and concrete and have a mass of not less than 500 kg. At least the uppermost 25 mm shall consist of steel, which shall be firmly attached to the concrete if present.

5.3.2. Test block

A hemispherical test block of hardwood or similar rigid material, with a soft metal or equivalent insert located at the top of its central vertical axis is mounted on a rigid support. Elasticated restraining straps are provided to assist in retaining the helmet in position during the test. They should be such as not to affect the correct performance of the test. A suitable apparatus is shown in figure 1.

5.3.3 Striker

Two types of striker are specified –

- a) a conical one
- b) a flat blade one.

The type of striker to be used is specified in the appropriate helmet standard.

The characteristics of the conical striker are as follows:-

Mass:	(3000 ± 25) g
Angle of point:	(60 ± 1)°
Radius of point:	(0,5 ± 0,1) mm
Minimum height of cone:	40 mm
Hardness of tip:	50 to 45 HRC

The characteristics of the flat blade striker are shown in figure 2 and are summarized below:-

Mass:	(400 ± 10) g
Thickness:	(6,0 ± 0,25) mm
Width of upper section:	(38,0 ± 0,25) mm
Include angle of taper of lower section:	(40 ± 2)°
Width of flat tip:	(0,25 ± 0,05) mm
Hardness of tip:	50 to 45 HRC

5.3.4 Guidance system

Means shall be provided for the striker to be dropped in free or guided fall.

The guidance system shall be such as to ensure that the striker:

- shall be positioned above the test block so that the central axis of the striker coincides with the point of impact on the helmet and

- falls on to the required impact position with an impact speed of not less than 95% of that which would theoretically obtain for a free fall.

5.3.5 Means to measure impact speed

Unless free fall is employed, means shall be provided to measure the striker speed at a distance of not more than 60 mm prior to impact, to within an accuracy of $\pm 1\%$.

The impact speed shall be measured during the commissioning of the apparatus. It need not be done for each impact, but has to be sufficiently regular to comply with 5.3.4.

5.4 Procedure

Within 1 minute of its removal from conditioning (this time applies to temperature conditioning only), fit the helmet to the test block so as to present the required impact point to the striker. Allow the striker to fall on to the specified impact point.

The impact energy shall be as specified in the appropriate helmet standard.

Note whether or not contact is made between the striker and the test block or whether the surface of the soft metal (or equivalent) insert in the test block is visibly damaged.

If necessary, restore the surface of the soft metal (or equivalent) insert in the test block, prior to a subsequent test.

If the design of the helmet permits direct contact between the test block and the striker, the test shall not be performed and the result shall be declared a failure.

5.5 Test report

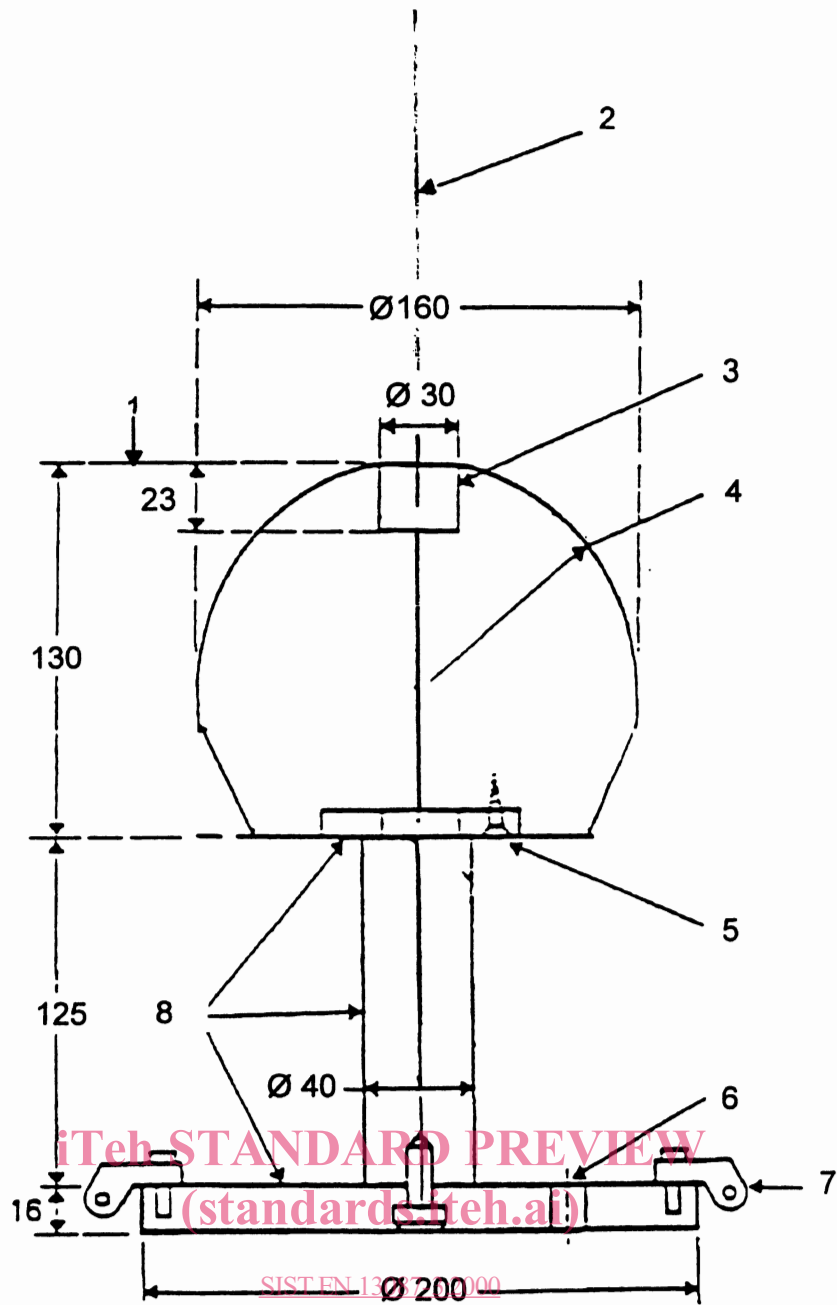
Report whether contact was made between the striker and the test block or whether the surface of the soft metal (or equivalent) insert test block was visibly damaged.

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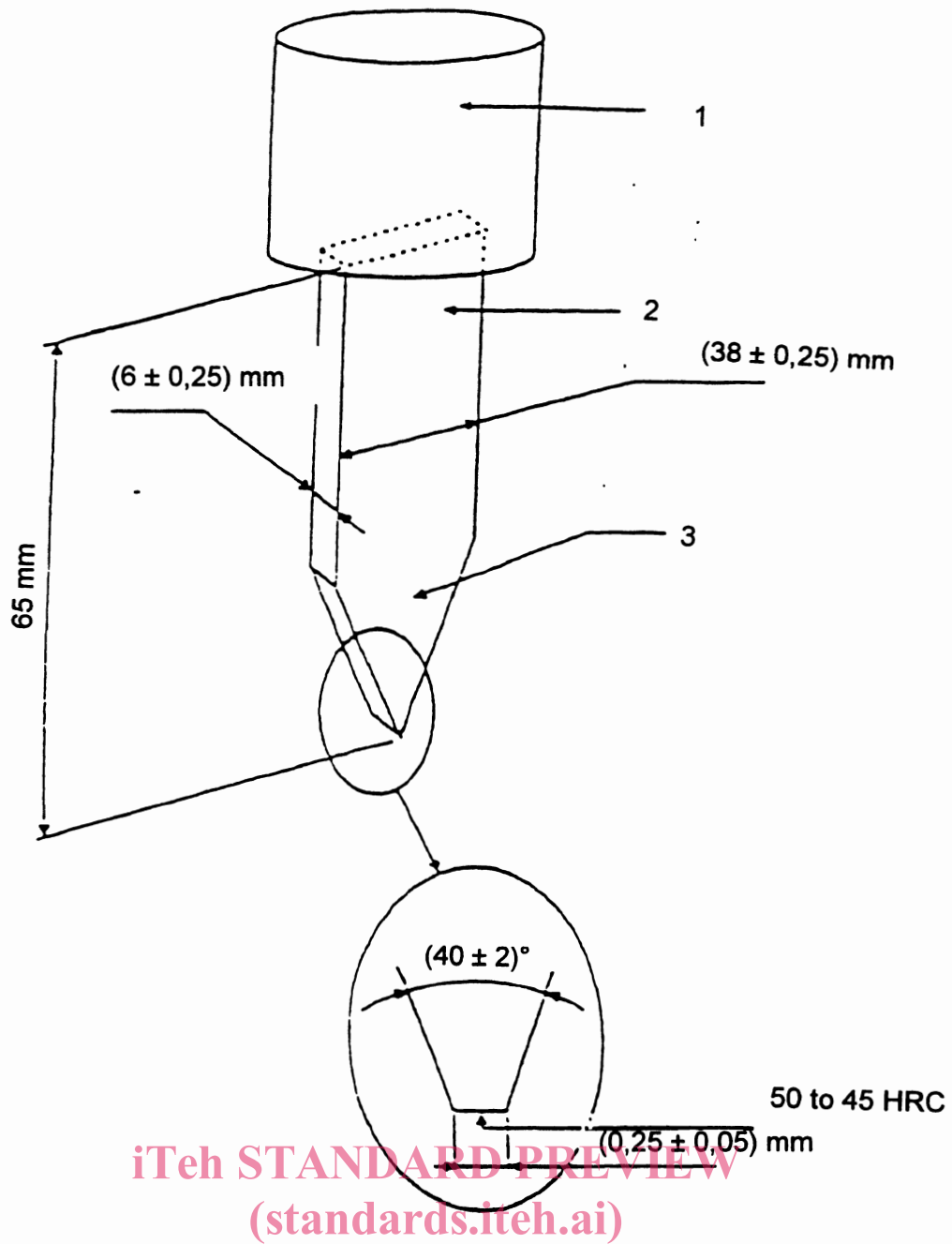
Dimensions in millimetres
Tolerances ± 1 mm unless otherwise indicated



Key

- | | | | |
|---|---------------------|---|----------------------|
| 1 | flat | 5 | 3 screws equi-spaced |
| 2 | striker axis | 6 | 3 holes equi-spaced |
| 3 | soft metal insert | 7 | Strap anchorages |
| 4 | spherical radius 65 | 8 | metal |

Figure 1 - Test block for testing penetration resistance



Key

- 1 Example of carriage
- 2 Upper section of blade
- 3 Lower section of blade

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Figure 2 - Flat blade striker for testing resistance to penetration