



SLOVENSKI STANDARD

SIST EN 397:1996

01-december-1996

Industrijske varovalne kacice

Industrial safety helmets

Industrieschutzhelme

Casques de protection pour l'industrie

Ta slovenski standard je istoveten z: EN 397:1995

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ICS:

13.340.20 Varovalna oprema za glavo Head protective equipment

SIST EN 397:1996

en

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ICS 13.340.10

Descriptors: Work safety, accident prevention, helmets, definitions, dimensions, characteristics, shock resistance, tests, marking, specifications

English version

Industrial safety helmets

Casques de protection pour l'industrie

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This European Standard was approved by CEN on 1995-02-10. 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.

The European Standards exist 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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CEN

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

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Foreword

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

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 EC Directive(s).

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of an identical text or by endorsement, at the latest by August 1995, and conflicting national standards shall be withdrawn at the latest by August 1995.

According to the CEN/CENELEC Internal Regulations, 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, United Kingdom.

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1 SCOPE

This European Standard specifies physical and performance requirements, methods of test and marking requirements for industrial safety helmets. The mandatory requirements apply to helmets for general use in industry. Additional optional performance requirements are included to apply only where specifically claimed by the helmet manufacturer.

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 373 : 1993	Protective clothing - Assessment of resistance of materials to molten metal splash
EN 960 : 1994	Headforms for use in the testing of protective helmets
ISO 4892 : 1981	Plastics - Methods of exposure to laboratory light sources

3 DEFINITIONS

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

3.1 Industrial safety helmet

Headgear, hereinafter referred to as a "helmet", primarily intended to protect the upper part of a wearer's head against injury from falling objects.

3.2 Shell

The hard, smoothly finished material that provides the general outer form of the helmet.

3.3 Peak

An extension of the shell above the eyes.

3.4 Brim

A rim surrounding the shell.

Note:- A brim may include a rain gutter.

3.5 Harness

The complete assembly that provides a means (a) of maintaining the helmet in position on the head, and/or (b) of absorbing kinetic energy during an impact.

Note:- A harness includes a headband and napestrap and may also include the items defined in 3.5.3 to 3.5.6.

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3.5.1 Headband

The part of the harness completely or partly surrounding the head above the eyes at approximately the largest horizontal circumference of the head.

Note:- The headband may include a nape strap.

3.5.2 Nape strap

The adjustable strap that fits behind the head below the plane of the headband.

Note:- A nape strap may be an integral part of the headband.

3.5.3 Cradle

The assembly of the parts of the harness in contact with the head, excluding the headband and nape strap.

Note:- A cradle may be either fixed or adjustable.

3.5.4 Cushioning

Material to improve wearing comfort.

3.5.5 Anti-concussion tapes

Supporting straps which absorb kinetic energy during an impact.

3.5.6 Comfort band or sweatband

An accessory to cover at least the inner front surface of the headband to improve wearer comfort.

3.6 Protective padding

Material contributing to the absorption of kinetic energy during an impact.

3.7 Ventilation holes

Holes provided in the shell which may allow circulation of air inside the helmet.

3.8 Chin strap

A strap which fits under the chin to help secure the helmet on the head.

3.9 Chin strap anchorage

The means by which the material of the chin strap is attached to the helmet. This includes, for example,

- a) the component(s) fitted to the ends of the chinstrap material for this purpose;
- b) that part of the helmet shell or of the headband where the chin strap is attached.

3.10 Helmet accessories

Any additional parts for special purposes such as chin strap, neck protector, drawlace, and attachment devices for lamp, cable, face protection and hearing protection.

3.11 Wearing height

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The vertical distance from the lower edge of the headband to the highest point of the headform on which the helmet is mounted, measured at the front (midway between the sides of the headform) and at the sides (midway between the front and back of the headform), whichever gives the greater distance.

3.12 External vertical distance

The vertical distance between the top of the headform on which the helmet is mounted and the highest point on the outside surface of the helmet shell.

Note:- This represents the height of the outer surface of the shell above the head when the helmet is worn, and relates to clearance under low roofs etc.

3.13 Internal vertical distance

The difference in level of the highest point on the outside surface of the helmet shell when the helmet is mounted on the headform:-

- 1) with the cradle present and
- 2) with the cradle and any protective padding in the crown area removed, so that the shell rests on the headform.

Note:- This represents the height of the inner surface of the shell above the head when the helmet is worn, and relates to stability.

3.14 Internal vertical clearance

The difference in level of the highest point on the outside surface of the helmet shell when the helmet is mounted on the headform:-

- 1) with the cradle present and
- 2) with the cradle removed and any protective padding in the crown area left in place.

Note:- This represents the depth of air space present immediately above the head when the helmet is worn, and relates to ventilation.

3.15 Horizontal distance

The horizontal distance between the headform on which the helmet is mounted and the inside of the shell measured at the level of the lower edge of the shell at the front (midway between the sides of the headform) and at the side (midway between the front and back of the headform).

4 PHYSICAL REQUIREMENTS

4.1 Materials and construction

The helmet shall include at least a shell and a harness.

Recommendations for materials and construction of helmets are given in Annex A.

For those parts of the helmet that come into contact with the skin, materials which are known to be likely to cause skin irritation or any adverse effect on health shall not be used.

There shall be no sharp edge, roughness or projection on any part of the helmet, its accessories or attachment devices, which are in contact, or potential contact, with the wearer, when the helmet is worn, such as is likely to cause injury to the wearer.

Any part of the helmet which can be adjusted, or removed by the wearer for the purpose of replacement, shall be so designed and manufactured as to facilitate adjustment, removal and attachment without the use of tools.

Any adjustment system incorporated within the helmet shall be so designed and manufactured as not to become incorrectly adjusted without the wearer's knowledge under the foreseeable conditions of use.

4.2 External vertical distance

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When measured under the conditions given in 6.5 the external vertical distance shall be not more than 80mm.

4.3 Internal vertical distance

When measured under the conditions given in 6.5 the internal vertical distance shall be not more than 50mm.

4.4 Internal vertical clearance

When measured under the conditions given in 6.5 the internal vertical clearance shall be not less than 25mm.

4.5 Horizontal distance

When measured under the conditions given in 6.5 the horizontal distance at the front and sides of the helmet shall be not less than 5mm.

4.6 Wearing height

Provision shall be made for the wearing height to be adjustable. When measured under the conditions given in 6.5 the wearing height at the front or sides of the helmet shall be not less than:-

80mm for helmets mounted on headform D
85mm for helmets mounted on headform G
90mm for helmets mounted on headform K.

4.7 Harness

A harness shall include a headband and nape strap.

4.7.1 Headband/Nape strap

The length of the headband or the nape strap shall be adjustable in increments of not more than 5mm.

Note:- The angle which the napestrap makes with the edge of the shell may be adjustable. This may be achieved by angular adjustment of the headband within the shell. This provision may improve helmet retention.

4.7.2 Cradle

If the cradle incorporates textile tapes, their individual widths shall be not less than 15mm, and the total of the widths of the tapes radiating from their intersection shall be not less than 72mm.

Note:- Further reference to textile tapes is made in Annex A.

4.7.3 Comfort band or sweatband

If provided, a sweatband shall cover the inner front surface of the headband for a length of not less than 100mm each side of the centre of the forehead. The length shall be measured with a flexible measure along a line 10 mm \pm 1mm above the lower edge of the headband. The sweatband shall have a width not less than that of the headband over the length which it covers.

Note:- Recommendations regarding characteristics of the sweatband are given in Annex A.

4.8 Chin strap

Either the helmet shell or the headband shall be fitted with a chin strap or with means of attaching one. Any chin strap supplied with the helmet shall be not less than 10mm wide when untensioned and shall be attached either to the shell or to the headband.

4.9 Ventilation

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If the helmet shell is provided with holes for ventilation purposes, the total area of such holes shall be not less than 150mm² and not more than 450mm².

Note 1: Means of closing the ventilation holes may be provided

Note 2: If such means are provided, the holes shall be opened to the maximum extent when the above measurement is performed

Note 3: Recommendations regarding design for ventilation are given in Annex A.

4.10 Accessories

For the fixing of helmet accessories, specified in the information accompanying the helmet, in accordance with 7.2.3, the required fixing devices, or appropriate holes in the helmet shell, shall be provided by the helmet manufacturer

5 PERFORMANCE REQUIREMENTS

5.1 Mandatory requirements

5.1.1 Shock absorption

When a helmet is tested by the method given in 6.6, the force transmitted to the headform shall not exceed 5,0kN. This requirement shall be satisfied by helmets treated in accordance with the appropriate conditioning processes given in 6.2, as specified by the list of mandatory tests given in 6.1.

5.1.2 Resistance to penetration

When a helmet is tested by the method given in 6.7, the point of the striker shall not contact the surface of the headform. This requirement shall be satisfied by helmets treated in accordance with the appropriate conditioning processes given in 6.2, as specified by the list of mandatory tests given in 6.1.

5.1.3 Flame resistance

When tested by the method given in 6.8, the materials of the shell shall not burn with the emission of flame after a period of 5 s has elapsed after removal of the flame.

5.1.4 Chin strap anchorages

When tested in accordance with 6.9, the artificial jaw shall be released at a force of not less than 150N and not more than 250N, due to failure only of the anchorage(s).

5.2 Optional requirements

5.2.1 Very low temperature (-20°C or -30°C)

When tested for shock absorption by the method given in 6.6, the requirement of 5.1.1 shall be satisfied by one helmet which has been conditioned in accordance with 6.2.7.

When tested for resistance to penetration by the method given in 6.7, the requirement of 5.1.2 shall be satisfied by a second helmet which has been conditioned in accordance with 6.2.7.

Helmets claimed to meet this requirement shall state this fact on the label attached to the helmet, in accordance with 7.2.2.

5.2.2 Very high temperature (+150°C)

When tested for shock absorption by the method given in 6.6, the requirement of 5.1.1 shall be satisfied by one helmet which has been conditioned in accordance with 6.2.8.

When tested for resistance to penetration by the method given in 6.7, the requirement of 5.1.2 shall be satisfied by a second helmet which has been conditioned in accordance with 6.2.8.

Helmets claimed to meet this requirement shall state this fact on the label attached to the helmet, in accordance with 7.2.2.

5.2.3 Electrical insulation

When tested by all three of the methods given in 6.10, the leakage current shall not exceed 1,2mA.

- Note 1:** This requirement is intended to provide protection to the wearer against short term, accidental contact with live electrical conductors at voltages up to 440vac.
- Note 2:** Test 1 is intended to simulate closely the in-use situation - that is, the leakage current to the wearer via a live conductor touching the shell.
- Note 3:** Test 2 is dependent only upon the transverse resistance of the shell (thickness). This effectively precludes the use of a metal shell, and of metal fasteners passing through the shell.
- Note 4:** Test 3 is dependent only upon the surface resistance of the shell, and effectively precludes the use of shells which have a conductive surface (eg metal electro-plating). This test was deemed to be necessary in order to obviate the danger to the wearer should he try to remove a helmet whose shell was in contact with a live conductor.

Helmets claimed to meet this requirement shall state this fact on the label attached to the helmet, in accordance with 7.2.2.

5.2.4 Lateral deformation

When tested by the method given in 6.11, the maximum lateral deformation of the helmet shall not exceed 40mm, and the residual lateral deformation shall not exceed 15mm.

Helmets claimed to meet this requirement shall state this fact on the label attached to the helmet, in accordance with 7.2.2.

5.2.5 Molten metal splash

When tested by the method given in 6.12, the helmet shell shall not:-

- a) be penetrated by the molten metal
- b) show any deformation, measured at right angles to the base plane of the helmet, greater than 10mm
- c) burn with the emission of flame after a period of 5 s has elapsed after the pouring of molten metal has ceased

Helmets claimed to meet this requirement shall state this fact on the label attached to the helmet, in accordance with 7.2.2.

6 TEST REQUIREMENTS

6.1 Samples

Helmets shall be submitted for testing in the condition in which they are offered for sale, including any requisite holes in the shell and other means of attachment of any accessories specified by the helmet manufacturer.

No helmet that has been subjected to testing shall be offered for sale.

The minimum number of samples and conditions required for one set of tests is as follows:-

Mandatory tests:-

- 1 helmet for shock absorption test at -10°C
- 1 helmet for shock absorption test following water immersion
- 1 helmet for shock absorption test at +50°C, then for flame resistance test
- 1 helmet for shock absorption test following artificial ageing