



**SLOVENSKI STANDARD**  
**SIST EN 397:2012+A1:2012**  
**01-december-2012**

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**Industrijske zaščitne čelade**

Industrial safety helmets

Industrieschutzhelme

Casques de protection pour l'industrie

**Ta slovenski standard je istoveten z: EN 397:2012+A1:2012**

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## Industrial safety helmets

Casques de protection pour l'industrie

Industrieschutzhelme

This European Standard was approved by CEN on 17 December 2011 and includes Amendment 1 approved by CEN on 19 July 2012.

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**EN 397:2012+A1:2012 (E)****Foreword**

This document (EN 397:2012+A1:2012) 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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 19 July 2012.

This document supersedes A1 EN 397:2012 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

This document 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 document.

Annex D provides details of significant technical changes between this European Standard and the previous edition. <https://standards.iteh.ai/catalog/standards/sist/1cca981f-2027-4a21-903e-b8b4738037cf/sist-en-397-2012a1-2012>

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## 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. Industrial safety helmets are intended primarily to provide protection to the wearer against falling objects and consequential brain injury and skull fracture.

## 2 Normative references

**[A1]** The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. **[A1]**

EN 960:2006, *Headforms for use in the testing of protective helmets*

EN ISO 472, *Plastics — Vocabulary (ISO 472:1999)*

EN ISO 9185:2007, *Protective clothing — Assessment of resistance of materials to molten metal splash (ISO 9185:2007)*

## 3 Terms and definitions

For the purposes of this document, the following terms and 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**

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

### 3.3

#### **peak**

extension of the shell above the eyes

### 3.4

#### **brim**

rim surrounding the shell

NOTE A brim may include a rain gutter.

### 3.5

#### **harness**

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 nape strap and may also include the items defined in 3.5.3 to 3.5.6.

**EN 397:2012+A1:2012 (E)****3.5.1****headband**

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**

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**

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**

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

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**3.6****protective padding**

material contributing to the absorption of kinetic energy during an impact

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**3.7****ventilation holes**

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

**3.8****chin strap**

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

**3.9****chin strap anchorage**

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**

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**

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**

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.

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**3.14****internal vertical clearance**

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

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- 1) with the cradle present; and <https://standards.iteh.ai/catalog/standards/sist/1cca981f-2027-4a21-903e-4738037cf/sist-en-397-2012a1-2012>
- 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**

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.

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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**

When measured under the conditions given in 6.5 the external vertical distance shall be no more than 80 mm.

**4.3 Internal vertical distance**

When measured under the conditions given in 6.5 the internal vertical distance shall be no more than 50 mm. See Figure 3.

**4.4 Internal vertical clearance**

When measured under the conditions given in 6.5 the internal vertical clearance shall be no less than 25 mm. See Figure 3.

**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 no less than 5 mm.

**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 no less than:

80 mm for helmets mounted on headform size designation 525 (equivalent to code D, EN 960:1994);

85 mm for helmets mounted on headform size designation 555 (equivalent to code G, EN 960:1994);

90 mm for helmets mounted on headform size designation 585 (equivalent to code K, EN 960:1994).

**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 no more than 5 mm.

NOTE The angle which the nape strap 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 no less than 15 mm, and the total of the widths of the tapes radiating from their intersection shall be no less than 72 mm.

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 no less than 100 mm each side of the centre of the forehead. The length shall be measured with a flexible measure along a line  $10 \text{ mm} \pm 1 \text{ mm}$  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 no less than 10 mm wide when un-tensioned and shall be attached either to the shell or to the headband.

#### 4.9 Ventilation

If the helmet shell is provided with holes for ventilation purposes, the total area of such holes shall be no less than  $150 \text{ mm}^2$  and not more than  $450 \text{ mm}^2$ .

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 At the time this European Standard was prepared no method for measuring the ventilation capacity of a helmet was recognized. However, manufacturers are encouraged to note the recommendations regarding design for ventilation 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 5,0 kN. 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.

**EN 397:2012+A1:2012 (E)****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 no less than 150 N and no more than 250 N, due to failure only of the anchorage(s).

**5.1.5 Label**

The label which may be attached to the helmet in accordance with 7.2.2 shall remain attached and legible on each sample helmet, following the appropriate conditioning in accordance with 6.2.3, 6.2.4, 6.2.5 or 6.2.6.

**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 properties**

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

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 440 V a.c.

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.