SLOVENSKI STANDARD
SIST EN 14052:2006

01-januar-2006

Industrijske ļelade z visoko stopnjo zaġļite

High performance industrial helmets

Hochleistungs-Industrieschutzhelme

Casques de protection a haute performance pour l'industrie

Ta slovenski standard je istoveten z: **EN 14052:2005**

ICS:

13.340.20 Varovalna oprema za glavo Head protective equipment

SIST EN 14052:2006 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14052

November 2005

ICS 13.340.20

English Version

High performance industrial helmets

Casques de protection à haute performance pour l'industrie

Hochleistungs-Industrieschutzhelme

This European Standard was approved by CEN on 26 September 2005.

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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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 14052:2005: E

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Foreword

This European Standard (EN 14052:2005) 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of an identical text or by endorsement, at the latest by May 2006, and conflicting national standards shall be withdrawn at the latest by May 2006.

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 European 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

Advances in materials and design methods have allowed helmets to be developed that have a higher performance than other types of general industrial helmets.

Helmets complying with European Standards offer a suite of head protection devices for general industrial use:

the industrial bump cap meeting the requirements of EN 812,

the industrial safety helmet meeting the requirements of EN 397, and

the high performance industrial helmet meeting the requirements of EN 14052.

Industrial bump caps are intended to provide protection to the wearer against the effects of striking his head against hard, stationary objects with sufficient severity to cause lacerations or other superficial injuries. They are not intended to provide protection against the effects of falling or thrown objects, or moving or suspended loads. In addition to the mandatory requirements the caps may have shock absorption properties at low temperatures, be flame resistant and have electrical properties.

Industrial safety helmets are intended primarily to provide protection to the wearer against falling objects and are not intended to provide protection against off crown impacts. The mandatory requirements for the helmets includes for them to have flame resistant properties. In addition to the mandatory requirements the helmets may have shock absorption properties at very low temperatures and very high temperatures, have electrical insulation properties, have lateral deformation properties, and provide protection against molten metal splash.

The high performance industrial helmet offers greater protection from falling objects, protection from off crown impacts and protection from penetration by a flat blade striker. It also includes a retention system that meets mandatory requirements for system release and system effectiveness properties. The helmet has the same flame resistant properties as the industrial safety helmet and offers the same optional protection against other risks with the exception of lateral deformation.

The technical committee, which has prepared this European Standard, realizes that mechanical rigidity is of importance for the wearer's safety. At the time the standard was prepared no valid test method was recognized. For that reason no requirements concerning mechanical rigidity have been introduced.

Designers are encouraged to accommodate ear, eye, and respiratory protection into the helmet design where required. When possible the design and performance of such additional protective functions should be in accordance with the relevant European Standard for these products. When this is not possible, the manufacturer will draw attention to any compromises by means of information supplied with the helmet.

The wearing of a helmet meeting the requirements of this European Standard will reduce, but not eliminate, the likelihood of head injury. There are limits to the amount of protection that can be provided. In the workplace, it remains the responsibility of the employer to judge the helmet's suitability for their particular purpose.

1 Scope

This European Standard specifies physical, performance, test and marking requirements for high performance industrial helmets.

High performance industrial helmets, as specified in this European Standard, are intended to provide to the wearer protection against falling objects and off crown impacts and the consequential brain injury, skull fracture and neck injury.

This European Standard includes mandatory requirements that apply to all high performance industrial helmets and additional, optional, performance requirements that apply only where specifically claimed by the helmet manufacturer.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) 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*

EN 13087-1, *Protective helmets — Test methods — Part 1: Conditions and conditioning*

EN 13087-2, *Protective helmets — Test methods — Part 2: Shock absorption*

EN 13087-3, *Protective helmets — Test methods — Part 3: Resistance to penetration*

EN 13087-5, *Protective helmets — Test methods — Part 5: Retention system strength*

EN 13087-7, *Protective helmets — Test methods — Part 7: Flame resistance*

EN 13087-8, *Protective helmets — Test methods — Part 8: Electrical properties*

EN 13087-10, *Protective helmets — Test methods — Part 10: Resistance to radiant heat*

EN ISO 472:2001, *Plastics — Vocabulary (ISO 472:1999)*

3 Terms and definitions

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

3.1
high performance industrial helmet
head protector, hereinafter referred to as 'helmet', primarily intended to provide the wearer with protection against falling objects and of crown impacts

NOTE The helmet may incorporate additional protective functions.

3.2
retention system
complete assembly by means of which the helmet is maintained in position on the head, including any devices for adjusting the system or enhancing the wearer's comfort

NOTE The retention system may include a chin strap.

3.3
chin strap
part of the retention system, consisting of a strap which fits under the chin to help secure the helmet on the head

3.4
crown
area on the upper outside surface of the helmet which lies within a 30° included solid angle from point G (see EN 960:1994, Figure 3) on the central vertical axis through the headform to which the helmet is fitted

3.5
integral additional protective function
part(s) of the helmet, intended by the helmet manufacturer not to be removed by the user, except for maintenance purposes, and which provide protection to the wearer, other than as provided for by this European Standard

3.6
non-integral additional protective function
additional protective device(s) which may be attached to the helmet and are intended to be removable by the user, but are not specifically required in order for the helmet to satisfy this European Standard

3.7
helmet accessory
additional device(s) which may be attached to the helmet and are intended to be removable by the user, but which provide no protective function to the wearer

3.8
helmet type
category of helmets which does not differ in such essential respects as the materials, dimensions or construction of the helmet or the retention system

4 Physical requirements

4.1 General

Unless otherwise specified, the values stated in this European Standard are expressed as nominal values. Except for temperature limits, values that are not stated as maxima or minima shall be subject to a tolerance of ± 5 %. Unless otherwise specified, the temperature values shall be in accordance with EN 13087-1.

4.2 Materials and construction

4.2.1 Innocuousness

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

Substances recommended for cleaning, maintenance or disinfection shall have no adverse effect on the helmet and shall be known not to be likely to have any adverse effect upon the wearer, when applied in accordance with the helmet manufacturer's instructions. See 7.2.2 f).

Information claiming that the product is innocuous shall be checked.

The following are examples of documents that shall be examined:

a) materials specifications;

b) safety data sheets relating to the materials;

c) information relating to the suitability of the materials for use with food, in medical devices, or other relevant applications;

d) information relating to toxicological, allergenic, carcinogenic, toxic to reproduction, or mutagenic investigations on the materials.

4.2.2 Visual inspection

There shall be no sharp edges, roughness or projection on any parts of the helmet 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 that can be adjusted, or removed by the wearer for the purpose of replacement (in accordance with the helmet manufacturer's instructions, see 7.2), 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.

NOTE Recommendations regarding wearer comfort are given in Annex A.

4.3 Chin strap

Any chin strap supplied with the helmet shall be not less than 10 mm wide when un-tensioned.

NOTE A chin strap may, or may not, be an essential part of the helmet, required to retain the helmet on the head. This will be specified by the helmet manufacturer and indicated by the markings on the helmet and in the manufacturer's information (see Clause 7).

5 Performance requirements

5.1 General

Helmets shall be tested with all integral additional protective functions (3.5) fitted. When non-integral additional protective functions (3.6) or helmet accessories (3.7) are submitted with the helmet for test, the helmet shall satisfy the requirements of this European Standard with and without these items fitted.

5.2 Mandatory requirements

5.2.1 Shock absorption

When a helmet is tested in accordance with 6.4, the force transmitted to the headform shall not exceed 5,0 kN for an impact to the crown and the deceleration of the striker shall not exceed 300 g for off-crown impacts.

5.2.2 Resistance to penetration

When a helmet is tested in accordance with 6.5, the point of the striker shall not contact the headform, nor shall the force transmitted to the headform exceed 5,0 kN for an impact to the crown or 15,0 kN for off-crown impacts.

5.2.3 Retention system release

If the helmet is fitted with a chin strap, it shall be tested in accordance with 6.6 and the artificial jaw shall be released at a force of not less than 150 N and not more than 250 N.

5.2.4 Retention system effectiveness

The helmet shall not become removed from the headform during the shock absorption and resistance to penetration tests (6.4 and 6.5).

When tested in accordance with 6.7, the helmet shall not fall off the head of more than two test subjects.

5.2.5 Flame resistance

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

5.2.6 Label

The label(s) which may be attached to the helmet in accordance with 7.1.2, shall remain attached and legible on each sample helmet, following the appropriate conditioning in accordance with

6.2.2 or where applicable 6.2.6,
6.2.3 or where applicable 6.2.7,
6.2.4,
6.2.5,
and where applicable 6.2.8.

5.3 Optional requirements

5.3.1 Performance at lower temperatures

When tested for shock absorption in accordance with 6.4, the requirement given in 5.2.1 shall be satisfied by two helmets which have been conditioned in accordance with 6.2.6.

When tested for penetration in accordance with 6.5, the requirement given in 5.2.2 shall be satisfied by two helmets which have been conditioned in accordance with 6.2.6.

Helmets claimed to meet this requirement shall state this fact on the label attached to the helmet in accordance with 7.1.2.

5.3.2 Performance at higher temperature

When tested for shock absorption in accordance with 6.4, the requirement given in 5.2.1 shall be satisfied by two helmets which have been conditioned in accordance with 6.2.7.

When tested for penetration in accordance with 6.5, the requirement given in 5.2.2 shall be satisfied by two helmets which have 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 7.1.2.

5.3.3 Resistance to radiant heat

When tested for shock absorption in accordance with 6.4, the requirement given in 5.2.1 shall be satisfied by two helmets which have been conditioned in accordance with 6.2.8.

When tested for penetration in accordance with 6.5, the requirement given in 5.2.2 shall be satisfied by two helmets which have been conditioned in accordance with 6.2.8.

In addition, the temperature measured at the surface of the test headform shall not rise by more than 25 °C above the prevailing ambient laboratory temperature. No part of the helmet shall melt to such a degree as to cause dripping of the material. Any damage or distortion exhibited by the helmet shall not adversely affect its operational capability.

Helmets claimed to meet this requirement shall state this fact on the label attached to the helmet in accordance with 7.1.2.

5.3.4 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 A.C. voltages up to 440 V.

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 outer surface of the helmet.

NOTE 3 Test 2 is dependent upon the transverse resistance of the helmet section. This effectively precludes the use of metal in, and of holes passing through, the helmet section.

NOTE 4 Test 3 is dependent only upon the surface resistance of the helmet, and effectively precludes the use of a conductive surface (e.g. 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 outer surface was in contact with a live conductor.

Helmets claimed to meet this requirement (for all 3 electrical properties tests) shall state this fact on the label attached to the helmet, in accordance with 7.1.2.

5.3.5 Molten metal splash

When tested in accordance with 6.11, the helmet 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 10 mm;

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 7.1.2.

6 Testing

6.1 Samples

Helmets shall be submitted for testing in the condition in which they are offered for sale, including any requisite holes or other means of attachment, for any item(s) as defined in 3.6 or 3.7.

If any items as defined in 3.6 and 3.7 are submitted with the helmet for testing, the helmet shall be tested with all the items fitted and without the items fitted.

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

The minimum number of samples and conditions per helmet type required to test to all performance requirements of this European Standard is as follows:

(i) Mandatory tests:

2 helmets for shock absorption (6.4) test at + 50 °C;

2 helmets for shock absorption (6.4) test at – 10 °C;

2 helmets for shock absorption (6.4) test following water immersion;

2 helmets for shock absorption (6.4) test following artificial ageing;

2 helmets for resistance to penetration (6.5) test at + 50 °C;

2 helmets for resistance to penetration test (6.5) at – 10 °C;