SLOVENSKI STANDARD
SIST EN 16471:2015

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Gasilske čelade - Čelade za gašenje v naravi

Firefighters helmets - Helmets for wildland fire fighting

Feuerwehrhelme - Helme für Wald- und Flächenbrandbekämpfung

Casques de sapeurs-pompiers - Casques pour la lutte contre les feux d'espaces naturels

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13.220.10	Gašenje požara	Fire-fighting
13.340.20	Varovalna oprema za glavo	Head protective equipment

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Firefighters helmets - Helmets for wildland fire fighting

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 16471:2014) 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of an identical text or by endorsement, at the latest by June 2015 and conflicting national standards shall be withdrawn at the latest by June 2015.

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 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.

The purpose of this European Standard is to provide minimum performance requirements for helmets designed for use for extended periods during wildland fire fighting and associated activities.

Wildland fire fighting involves work primarily in summer temperatures, for many hours during which the fire fighter may develop high levels of metabolic heat. Consequently, the protective helmet should be comfortable, light and commensurate with the risks to which the fire fighter may be exposed in order to be effective without introducing heat stress to the wearer.

This European Standard does not cover helmets for use in situations where helmets conforming to EN 443 are more suitable.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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 the minimum requirements for wildland fire fighting helmets protecting the upper head mainly against the effects of impact, penetration, heat, flame and burning embers while conducting fire fighting and associated activities in wildland environments. Requirements for marking and information to be supplied by the manufacturer are included. Wildland fire fighting involves direct and indirect attack techniques (like wood cutting).

Wildland environments include forests, crops, plantations and grass/heath/scrub or farmland.

Helmets for use while fire fighting in buildings and other structures are not covered by this European Standard (see EN 443). This helmet is not intended to provide protection during fire entrapment.

Protection of the face, eyes, ears and neck may require additional items of personal protective equipment (PPE), which are not covered by this European Standard.

2 Normative references

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.

EN 168:2001, *Personal eye-protection - Non-optical test methods*

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

EN 1811, *Reference test method for release of nickel from all post assemblies which are inserted into pierced parts of the human body and articles intended to come into direct and prolonged contact with the skin*

EN 13087-1:2000, *Protective helmets - Test methods - Part 1: Conditions and conditioning*

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

EN 13087-3:2000, *Protective helmets - Test methods - Part 3: Resistance to penetration*

EN 13087-4, *Protective helmets - Test methods - Part 4: Retention system effectiveness*

EN 13087-5:2012, *Protective helmets — Test methods — Part 5: Retention system strength*

EN 13087-6, *Protective helmets - Test methods - Part 6: Field of vision*

EN 13087-7:2000, *Protective helmets - Test methods - Part 7: Flame resistance*

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

EN ISO 13688, *Protective clothing - General requirements (ISO 13688)*

ISO 17493, *Clothing and equipment for protection against heat — Test method for convective heat resistance using a hot air circulating oven*

3 Terms and definitions

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

3.1
helmet for wildland fire fighting
headwear, including all integral components supplied by the manufacturer, intended primarily to protect the upper part of a wearer's head against hazards which may occur during wildland fire fighting activities

Note 1 to entry: Hereafter, helmets for wildland fire fighting are referred to as helmets.

3.2
helmet shell
component in hard material with a smooth finish, which gives the helmet its general shape

3.3
protective padding
material and/or suspension system which serves to dampen impact energy

3.4
retention system
those parts which are responsible for securing the helmet in position on the head, including items which enable adjustment or improved comfort

3.5
chin strap
part of a retention system, including a strap which passes under or on the wearer's chin and which helps to ensure that the helmet is correctly maintained in place

3.6
head form
shape replacing the head which is used for testing certain characteristics

Note 1 to entry: The head form is designed in accordance with EN 960.

3.7
accessories
additional device(s) supplied or recommended by the manufacturer which may be attached to the helmet but which provide no protective function to the wearer

EXAMPLES Lamp brackets, cable clips, badges and trims.

3.8
non-integral additional protective devices
additional protective device(s) supplied or recommended by the manufacturer which may be attached to the helmet and intended to be removable by the user

EXAMPLES Mesh visors, ear defenders, neck-guard and safety goggles.

4 Physical requirements

4.1 Materials

For those parts of the helmet coming, or that may come, into contact with the skin the material used shall not be subject to any known appreciable alteration from contact with sweat or with substances likely to be found in toiletries. Materials shall not be used which are known to cause skin disorders or other adverse effects on health.

Examples of documents, which can be presented as evidence of chemical innocuousness, are given in the note.

NOTE The following list of documents is given for information and as examples of documents to 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;

e) information relating to ecotoxicological and other environmental investigations on the materials.

The examination should determine whether the claim that the materials are suitable for use in the protective helmet is justified. Particular attention needs to be paid to the presence of plasticisers, unreacted components, heavy metals, impurities and the chemical identity of pigments and dyes.

All metallic materials which could come into prolonged contact with the skin (e.g. studs, fittings) shall have a release of Nickel of less than 0,5 µg/cm^3 per week, when tested according to EN 1811.

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

Materials shall conform to the relevant requirements of EN ISO 13688.

4.2 Projections

There shall be no sharp edges, roughness or projections on any part of the helmet, which are likely to cause injury to the wearer, in contact or potential contact with the wearer when the helmet is worn. Test according to 6.14.

4.3 Retention system

The helmet shall be fitted with a retention system, including a chinstrap. The chinstrap shall be adjustable in length.

4.4 Accessories and non-integral additional protective devices

When the helmet manufacturer states any accessories and/or non-integral additional protective devices, as defined in 3.7 and 3.8, as being for use with the helmet, the helmet with such items fitted to it shall continue to satisfy the requirements of this European Standard.

However, some accessories and/or non-integral additional protective devices may not be suitable for wildland fire fighting and only suitable for non-fire fighting associated activities such as wood cutting, road clearance, etc. In such cases, information shall be provided by the manufacturer as to the conditions under which such accessories and/or non-integral additional protective devices may be used.

If accessories and non-integral additional protective devices are supplied and/or recommended by the helmet manufacturer they shall individually conform to the requirements of the appropriate standard related to that specific device.

5 Performance requirements

5.1 Extent of Coverage

When the helmet is tested by the method described in 6.4, it shall cover at least area situated above plane AA' as defined in EN 960:2006, Figure 1.

5.2 Shock absorption

5.2.1 Crown impact

When a helmet is tested by the method described in 6.5.2, the force transmitted to the head form shall not exceed 5 kN, for an impact energy of (50 ± 2) J.

5.2.2 Lateral impacts (front, side, rear)

When a helmet is tested by the method described in 6.5.3, the force transmitted to the head form shall not exceed 5 kN, for an impact energy of (25 ± 1) J.

5.3 Penetration resistance

When a helmet is tested by the method described in 6.6, there shall be no contact between the striker and the test block, for an impact energy of (30 ± 1) J.

5.4 Retention system effectiveness

When a helmet is tested by the method described in 6.7, the helmet shall not come completely off the head form.

5.5 Retention system strength

When a helmet is tested by the method described in 6.8, the following shall apply:

a) Maximum dynamic elongation shall not exceed 25 mm under the intermediate load condition;

b) Minimum width of the chin strap under intermediate load condition shall be 15 mm;

c) The release point of the retention system shall be between 500 N and 1 000 N.

5.6 Flame resistance

5.6.1 Helmet shell

When a helmet is tested by the method given in 6.9.1, any of the externally exposed materials of the helmet shell, not within 5 mm of an edge, shall not burn with the emission of flame or drip molten material after a period of 5 s has elapsed from removal of the flame.

5.6.2 Retention system

Materials of the retention system that are outside of the helmet shell, when tested by the method given in 6.9.2, shall not burn with the emission of flame or drip molten material after a period of 5 s has elapsed from the removal of the flame.

5.6.3 Accessories and non-integral additional protective devices

Any items as defined in 3.7 and 3.8 stated as being for use with the helmet by the helmet manufacturer for wildland firefighting and associated operations and on the outside of the helmet shell, shall be tested by the

method given in 6.9.1 in their in-use position. The flame shall not be applied within 5 mm of any edge of the item and the item shall not burn with the emission of flame or drip molten material after a period of 5 s has elapsed from the removal of the flame.

5.7 Radiant heat protection / thermal stress

When a helmet is tested by the method given in 6.10, the following requirements shall be met during all heating cycles;

a) the temperature inside the helmet shall not increase by more than 25 °C;

b) no material shall ignite or melt to such a degree as to cause softening or dripping of material so that material that is not in contact with the head form before this test comes into contact with the head form as a result of this test. Test by visual inspection.

If the helmet manufacturer states any accessories and/or non-integral additional protective devices as defined in 3.7 and 3.8 as being for use with the helmet for wildland fire fighting, the helmet with such items fitted to it, in their in-use position shall also satisfy these requirements.

Upon completion of 3 heating cycles and testing according to 6.10, the helmet shall conform to the impact test requirements according to 5.2.1.

5.8 Thermal resistance

When the helmet is tested by the method given in 6.11, it shall conform to the following requirements:

a) no material that is not in contact with the head form before this test shall come into contact with the head form as a result of this test. Test by visual inspection;

b) there shall be no separation, melting or dripping of material;

c) any moveable elements shall remain functional;

d) there shall be no ignition of any material; and

e) there shall be no ignition, melting or loss of legibility of the product labels.

If the helmet manufacturer states that any accessories and/or non-integral additional protective devices, as defined in 3.7 and 3.8, as being for use with the helmet for wildland firefighting, the helmet with such items fitted to it in their in-use position shall also satisfy these requirements.

5.9 Resistance to hot solids

No complete penetration, burning, or molten drip of the helmet shell shall occur within 7 s when a helmet is tested by the method given in 6.12.

5.10 Field of vision

When the helmet is tested in accordance with 6.13, the wearer's field of vision shall correspond to the following angles:

a) horizontal field of vision of not less than 105° on both right and left sides;

b) vertical field of vision in the upwards direction of not less than 7°;

c) vertical field of vision in the downwards direction of not less than 45°; and