



# SLOVENSKI STANDARD SIST EN 443:2008

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SIST EN 443:1998

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## Gasilske čelade za gašenje v stavbah in drugih zgradbah

Helmets for fire fighting in buildings and other structures

Feuerwehrlhelme für die Brandbekämpfung in Gebäuden und anderen baulichen Anlagen

Casques pour la lutte contre les incendies dans les bâtiments et autres structures  
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Ta slovenski standard je istoveten z: **SIST EN 443:2008**

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EUROPEAN STANDARD  
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## Helmets for fire fighting in buildings and other structures

Casques pour la lutte contre les incendies dans les  
bâtiments et autres structures

Feuerwehrlhelme für die Brandbekämpfung in Gebäuden  
und anderen baulichen Anlagen

This European Standard was approved by CEN on 28 December 2007.

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 CEN Management Centre or to any CEN member.

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**EN 443:2008 (E)****Foreword**

This document (EN 443:2008) 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of an identical text or by endorsement, at the latest by August 2008, and conflicting national standards shall be withdrawn at the latest by August 2008.

This document supersedes EN 443:1997.

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.

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

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## Introduction

Minimum requirements for helmets protecting the lower face and the neck are included in this European Standard. Requirements for other products protecting the lower face and neck are also covered in other European Standards. This European Standard allows options to take account of particular additional requirements.

This European Standard deals with two types of helmets: type A and type B. Selection of the type of helmet and any optional equipment should be made following a comprehensive risk assessment.

Annex A gives an informative list of hazards.

Firefighters should be trained in the use, care and maintenance of helmets covered by this European Standard, including an understanding of any limitations.

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**EN 443:2008 (E)****1 Scope**

This European Standard specifies minimum requirements for firefighters' helmets protecting the upper head mainly against the effects of impact, penetration and heat and flame, whilst firefighting in buildings and other structures.

**2 Normative references**

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

EN 136:1998, *Respiratory protective devices — Full face masks — Requirements, testing, marking*

EN 137:2006, *Respiratory protective devices — Self-contained open circuit compressed air breathing apparatus with full face mask — Requirements, testing, marking*

EN 166:2001, *Personal eye-protection — Specifications*

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

EN 469:2005, *Protective clothing for firefighters — Performance requirements for protective clothing for firefighting*

EN 531:1995, *Protective clothing for industrial workers exposed to heat (excluding firefighters' and welders' clothing)*

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

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

EN 13087-2:2000, *Protective helmets — Test methods — Part 2: Shock absorption*

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

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

EN 13087-5:2000, *Protective helmets — Test methods — Part 5: Retention system strength*

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

EN 13087-8:2000, *Protective helmets — Test methods — Part 8: Electrical properties*

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

EN 13911, *Protective clothing for firefighters — Requirements and test methods for fire hoods for firefighters*

EN 14458:2004, *Personal eye-equipment — Face shields and visors for use with firefighters' and high performance industrial safety helmets used by firefighters, ambulance and emergency services*

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

ISO 1817:2005, *Rubber, vulcanized — Determination of the effect of liquids*



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 purpose of this document, the terms and definitions given in EN 960:2006 and the following apply.

#### 3.1

##### **helmet for firefighting in buildings and other structures (hereafter referred to as 'helmet')**

headwear, for the protection of the wearer's head against hazards which might occur during operations of firefighting in buildings and other structures

#### 3.2

##### **area of protection**

specific area on a headform for which protection is intended to be provided by the helmet

NOTE This European Standard envisages five areas as defined in 3.3 to 3.7.

#### 3.3

##### **area 1a**

area situated above plane 'AA' as defined in Figure 1

#### 3.4

##### **area 1b**

area situated between plane 'AA' and points CDEF as defined in Figure 1

#### 3.5

##### **area 2**

at least the area defined for an eye-guard in EN 14458:2008

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#### 3.6

##### **area 3a**

area on the neck-guard from the lower edge of the shell to the lower edge of the neck-guard and rearward from the vertical transverse plane, or part thereof

#### 3.7

##### **area 3b**

at least the area CDHG defined in Figure 2

#### 3.8

##### **type A helmet**

helmet protecting at least area 1a

#### 3.9

##### **type B helmet**

helmet protecting at least areas 1a and 1b

#### 3.10

##### **headform**

shape replacing the head which is used for testing certain helmet characteristics

#### 3.11

##### **sagittal plane of the helmet**

plane corresponding with the longitudinal vertical median plane of the headform when the helmet is correctly adjusted on it according to manufacturer's instructions of use

**EN 443:2008 (E)****3.12****vertical axis of the helmet**

axis corresponding with the central vertical axis of the headform when the helmet is correctly adjusted on it according to manufacturer's instructions of use

**3.13****basic shape**

outer shape which the helmet would have if it had neither comb nor brim nor any of the fairings or radiusing associated with these

**3.14****helmet shell**

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

**3.15****comb**

raised part of the shell that runs along the mid-sagittal plane

**3.16****brim**

ridge protruding outwards from the basic shape of the shell forming the lower edge of the shell and including its associated fairings and radiusing

**3.17****accessory**

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

NOTE Examples of accessories are lamp brackets, cable clips, badges and trims.

**3.18****integral additional protective function**

part(s) of the helmet, intended by the helmet manufacturer not to be removed by the user, except for maintenance and fitting purposes, and which provide protection to the wearer

NOTE The protection afforded to the wearer by the integral additional protective function is not within the scope of this European Standard.

**3.19****non-integral additional protective function**

additional protective device(s) which may be attached to the helmet and intended to be removable by the user

NOTE Non-integral additional protective functions are optional and are not specifically required for conformity to this European Standard.

**3.20****energy absorption system**

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

**3.21****comfort system**

material and/or system which serves to improve comfort for the wearer

**3.22****retention system**

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

**3.23****chinstrap**

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

**3.24****neck-guard**

part which protects the neck (area 3a) from liquids, hot materials, radiant heat and flames

**3.25****face protector**

part that protects at least the part of the face that is defined by area 2

**3.26****ear covers**

part of the helmet which protects at least the ears of the wearer

**3.27****dripping**

softening with material movement and consequent detachment

**3.28****badge**

material attached to the helmet for purposes of identification

**3.29****trim**

retro reflective and/or fluorescent material attached to the outermost surface of the helmet shell e.g. for visibility enhancement

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**4 Requirements****4.1 General****4.1.1 Surface finish**

When tested in accordance with 5.2 there shall be no sharp edges, roughness or projection on any part of the helmet that may cause discomfort or injury to the wearer during fitting, wearing or maintenance.

**4.1.2 Innocuousness of materials**

When tested in accordance with 5.2 materials that may come into contact with the wearer's skin shall not be known to be likely to cause irritation or any other adverse effect to health.

**4.1.3 Visual defects**

All materials shall be visibly unimpaired after cleaning and disinfection by the agents and procedures specified by the manufacturer in the information supplied.

Such agents shall not be known to be likely to cause irritation or any other adverse effect to the health of the wearer.

**4.1.4 Additional devices and accessories**

When items as defined in 3.17, 3.18 and 3.19 are stated as being for use with the helmet by the helmet manufacturer, the helmet with such items fitted to it shall continue to satisfy the requirements of this European Standard.

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### 4.1.5 Face protectors

Face protectors intended for use and supplied with helmets conforming to this European Standard shall conform to the requirements of EN 14458.

When protection of Area 2 is provided or recommended by the helmet manufacturer for use with a helmet complying with this European Standard, it shall be by a face protector conforming to EN 14458.

### 4.1.6 Neck guards

When neck-guards are provided or recommended by the helmet manufacturer for use with a helmet complying with this European Standard, the neck-guards shall conform to the requirements for area 3a as appropriate.

### 4.1.7 Protection of area 3b

When protection of area 3b is provided or recommended by the helmet manufacturer for use with a helmet complying with this European Standard, this protection shall conform to the requirements for area 3b as appropriate.

### 4.1.8 Wearing the helmet

The constraints imposed by the wearing of the helmet shall be minimized, so as to enable the wearer to perform structural firefighting.

NOTE Annex C gives guidance to verify this requirement.

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## 4.2 Shock absorption

### 4.2.1 Area 1a

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When the helmet is tested in accordance with 5.4.1, the force transmitted to the headform shall not exceed 15 kN.

### 4.2.2 Areas 1a and 1b

When tested in accordance with 5.4.2:

- a) projectile shall be prevented from passing completely through the helmet;
- b) there shall be no release of material from the inner surface of the helmet;
- c) where protection is provided by non-rigid material, there shall be no additional contact with the headform such that a mark appears on the white paper on the opposite side to that struck by the ball.

## 4.3 Resistance to penetration

When the helmet is tested in accordance with 5.5, there shall be no contact between the striker and the test block.

## 4.4 Lateral crushing

When the helmet is tested in accordance with 5.6, the maximum transverse and longitudinal deformations of the helmet shall not exceed 40 mm. The residual deformations shall not exceed 15 mm.

## 4.5 Retention system effectiveness

When the helmet is tested in accordance with 5.7 it shall not come off the headform.

## 4.6 Retention system strength

This clause applies to helmets for which a chin strap is recommended or provided by the helmet manufacturer for use with the helmet.

When the helmet is tested in accordance with 5.8:

- a) maximum elongation of the whole system shall not exceed 20 mm for a load of 250 N;
- b) minimum width of the chin strap shall be 15 mm for a load of 250 N;
- c) release point of the retention system shall be between 500 N and 1 000 N.

## 4.7 Radiant heat

### 4.7.1 Areas 1a and 1b

When the helmet is tested in accordance with 5.9.1:

- a) temperature measured at the surface of the artificial head shall not rise more than 25 °C above the standard laboratory temperature, (20 ± 2) °C;
- b) no part of the helmet providing protection to areas 1a and 1b shall ignite or melt to such a degree as to cause softening or dripping of material such that there is contact of the material with the headform;
- c) the helmet shall continue to conform with the shock absorption (area 1a and 1b as appropriate, see 4.2) and resistance to penetration (area 1a only see 4.3) requirements following radiant heat exposure.

### 4.7.2 Areas 3a and 3b

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When tested in accordance with 5.9.2, the components protecting areas 3a and 3b shall achieve at least performance level 1 according to 6.3 of EN 469:2005. In the case where area 3b protection is provided by way of a face protector complying with EN 14458, testing of area 3b is exempt from this requirement.

## 4.8 Protection against hot solids

When the helmet is tested in accordance with 5.10 it shall conform to the requirements of EN 166:2001, 7.2.3 f).

## 4.9 Protection against molten metals

### 4.9.1 Areas 1a and 1b

When tested in accordance with 5.11.1, 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.

### 4.9.2 Areas 3a and 3b

When the test is performed in accordance with 5.11.2 it shall conform to the requirements of EN 531:1995, 6.5.