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BSI Standards Publication

PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures

Part 5: Helmets

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National foreword

This British Standard is the UK implementation of ISO 11999-5:2024. It supersedes BS ISO 11999-5:2015, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PH/14, Firefighters' personal protective equipment.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Second edition
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Part 5: Helmets

Équipement de protection individuelle pour pompiers — Méthodes d'essai et exigences pour les équipements de protection individuelle utilisés par les pompiers qui risquent d'être exposés à des niveaux élevés de chaleur et/ou de flamme lorsqu'ils combattent des incendies dans des structures —

Partie 5: Casques

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 94, *Personal safety — Protective clothing and equipment,* Subcommittee SC 14*, Fire-fighters' personal equipment*.

This second edition cancels and replaces the first edition (ISO 11999-5:2015), which has been technically revised.

The main changes are as follows:

— the content has been revised with a focus on single performance requirements.

A list of all parts in the ISO 11999 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

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PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures —

Part 5:
Helmets

1 Scope

This document specifies the minimum design and performance requirements for helmets as part of personal protective equipment (PPE) to be used by firefighters, primarily but not solely to protect against impact and exposure to flame and high thermal loads.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 3146, *Plastics — Determination of melting behaviour (melting temperature or melting range) of semi-crystalline polymers by capillary tube and polarizing-microscope methods*

ISO 6330:2021, *Textiles — Domestic washing and drying procedures for textile testing*

ISO 6942:2022, *Protective clothing — Protection against heat and fire — Method of test: Evaluation of materials and material assemblies when exposed to a source of radiant heat*

ISO 9151, *Protective clothing against heat and flame — Determination of heat transmission on exposure to flame*

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

ISO 11612:2015, *Protective clothing — Clothing to protect against heat and flame — Minimum performance requirements*

ISO 11999-3, *PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 3: Clothing*

ISO 11999-9, *PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 9: Firehoods*

ISO 13688:2013 + ISO 13688:2013/Amd.1:2021, *Protective clothing — General requirements*

ISO 15025, *Protective clothing — Protection against flame — Method of test for limited flame spread*

ISO 17492, *Clothing for protection against heat and flame — Determination of heat transmission on exposure to both flame and radiant heat*

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

ISO/TR 19591, *Personal protective equipment for firefighters — Standard terms and definitions*

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EN 136:1998, *Respiratory protective devices - Full face masks*

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

EN 167:2001, *Personal eye protection — Optical test methods*

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

EN 172:1994 + A1:2000, *Personal eye protection — Sunglare filters for industrial use*

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

EN 13087-1:2012, *Protective helmets — Test methods — Part 1: Conditions and conditioning*

EN 13087-2:2012, *Protective helmets — Test methods — Part 2: Shock absorption*

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

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

NFPA 1971:2018, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*

CIE 54.2, *Retroreflection – Definition and measurement*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TR 19591 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Helmet requirements

4.1 General

Helmets shall consist of at least the following assembled components:

a) Shell (at the minimum area above the A-A' line as per Figure 1).

b) Energy absorbing system.

c) Retention system. The retention system shall include a chinstrap having a minimum width of 19 mm, quick release buckle, and size adjustment mechanism.

d) Neck protector and/or ear covers, or Shikoro.

e) Face shield or goggles or both —

— where a face shield is selected, the face shield shall be attached to and tested with the helmet;

— where goggles are selected, the goggles shall be permitted to be removed from the helmet before it is tested. This only applies to those which are removable. Where they are attached to the helmet, they shall be tested with the helmet.

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f) Retro-reflective material.

4.1.1 Fit

The fit of the helmet shall be adjustable laterally and/or vertically to improve the wearing comfort and the helmet efficiency. This adjustment shall be easily done by the wearer without the use of tools. It should be possible for the wearer to remove the helmet by loosening the chinstraps, using one hand wearing a structural firefighting glove.

When this adjustment covers several sizes of head circumference, the relevant instructions shall be given in the information supplied by the manufacturer.

4.1.2 Protrusions and sharp edges

There shall be no sharp edges, roughness, or projection on any part of the helmet. Projections intruding more than 5 mm from the shell interior surface and above the test line, shall not be acceptable unless covered by protective padding or impact liner. Projections above the test line shall be impacted directly over the position of the said projection in accordance with 4.4.2.1, and the testing laboratory shall assess that the projection did not make contact with the head form.

Rigid internal projections below the test line and above the reference plane shall not be able to touch the head of the wearer when the helmet is normally affixed to the head.

The profile at the front of the helmet shall not prevent the wearing of spectacles or goggles as specified by the helmet manufacturer.

4.1.3 Reinforcement

The shell construction shall be uniformly reinforced. This does not exclude a gradual increase of the shell's thickness or of the grooves or fixation devices of the harness or of the accessories, but it does exclude every other localized reinforcement.

4.1.4 Protected area

When adjusted on the head form as in 4.2.2, the helmet shall at the minimum cover the entire area 12,7 mm above the reference plane (see line A -A' in Figure 1).

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