INTERNATIONAL STANDARD

ISO 18639-5

First edition
2018-11

PPE ensembles for firefighters undertaking specific rescue activities —

Part 5: **Helmet**

Équipements de protection personnelle pour pompiers entreprenant des activités de sauvetage particulières —

Partie 5: Casque

Reference number
ISO 18639-5:2018(E)

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Published in Switzerland

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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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 94, *Personal safety — Personal protective equipment*, Subcommittee SC 14, *Firefighters' personal equipment*.

A list of all the parts in the ISO 18639 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

ISO 18639 is a series of standards for personal protective equipment (PPE) for firefighters when engaged in specific rescue activities. It is not possible to provide a standard for PPE to cover all of the diverse range of rescue scenarios that firefighters are likely to encounter so it is important that risk assessments be undertaken to determine if the PPE covered by the ISO 18639 series is suitable for its intended use and the expected exposure to hazards. For complete protection against exposures, the risk assessment should include protection of the whole body including the torso, arms and legs, head, face, hands and feet.

For certain rescue activities, safety ropes and harnesses may be required. For certain rescue situations, special PPE for use in and on water may be required. In some cases, appropriate respiratory protection may also be identified as being necessary.

The performance requirements in this document take account of accidental exposure to heat and flame, but do not cover PPE for firefighting. While this document takes account of accidental exposure to some common chemicals, it is not intended that PPE conforming to this document should be considered as providing chemical protection as a primary function. It does not cover PPE to protect against biological, electrical or radiation hazards. The risk assessment should determine whether PPE complying with this document or to the requirements of any other relevant standard is more suitable.

Firefighters should be trained in the use, care and maintenance of the PPE covered by this document, including an understanding of its limitations.

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PPE ensembles for firefighters undertaking specific rescue activities —

Part 5: Helmet

1 Scope

This document provides the principles that govern the development of incident type and/or hazard specific test methods and minimum performance requirements for helmets for firefighters while engaged in specific rescue activities.

Helmets related to specific rescue activities, such as road traffic crash (RTC) and urban search and rescue (USAR), are documented in individual subclauses of this document.

NOTE Further guidance can be found in ISO 18639-1.

The purpose of this document is to ensure that minimum performance requirements for incident type and/or hazard specific helmets are designated.

This document covers general helmet design, the minimum performance level of the materials used and the methods of test for determining this performance level.

It does not cover special helmets for use in other high risk situations such as firefighting.

This document does not cover protection for the torso, arms, legs and feet or protection of the hands against other hazards, e.g. chemical, biological, radiation and electrical hazards, except for limited, accidental exposure to fire ground chemicals and contaminated blood or body fluids.

Selection of the appropriate system of personal protective equipment, (PPE), including helmets, is dependent on carrying out an effective risk assessment which identifies the hazard to be faced, evaluates the likelihood of those hazards and provides the means of reducing or eliminating these hazards.

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

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

EN 960, *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, *Protective helmets — Test methods — Part 2: Shock absorption*

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

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

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

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

EN 16473:2014, *Firefighters helmet — Helmets for technical rescue*

3 Terms and definitions

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

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

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

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

3.1
helmet for technical rescue
hardware, 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 technical rescue activities

Note 1 to entry: Hereafter, helmets for technical rescue 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
retention system
those parts which are responsible for securing the helmet in position on the head, including items which enable adjustment or improved comfort

3.4
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

3.5
headform
shape that replaces the head and is used for testing certain characteristics

Note 1 to entry: The design of the headform complies with EN 960:2006, 3.7.

3.6
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

EXAMPLE Lamp brackets, cable clips, badges and trims.

3.7
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

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

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3.8
failure modes and effects analysis
FMEA
method used to derive design features that are difficult to test in a laboratory, and not allowed to be tested on humans, such as skin irritations

4 Physical requirements

4.1 Material and construction

Materials used in helmets 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.

This shall be addressed by the FMEA conducted by the manufacturer.

NOTE A typical FMEA process is given for information in Annex B.

4.2 Projections

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

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 3.6 and 3.7, being used with the helmet, the helmet fitted with such items shall continue to meet the requirement of this document.

4.5 Inspection

The inspection shall be made prior to laboratory or practical performance tests or as specified in the standard. This may entail a certain amount of assembly, dismantling or adjustment of the helmet. The inspection shall include a report of the findings and assessments.

Inspection shall include, where applicable, an assessment of;

a) visible damage, deformation, and corrosion;

b) operation of connections, including with the use of gloves (if required);

c) the need for special tools;

d) compatibilities with other PPE or equipment;

e) marking;

f) information provided by the helmet manufacturer;

g) documentation, e.g. safety data sheets or declarations relevant to the materials used, a written declaration with relevant parts of the FMEA.

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