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Wildland firefighting personal protective equipment — Requirements and test methods —

Part 9: Firehoods

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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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC94, *Personal safety – Protective equipment*, Subcommittee SC14, *Firefighters personal equipment*.

This second edition cancels and replaces the first edition (ISO 16073:2011(E), which has been technically revised.

The main changes compared to the previous edition are as follows:

- the standard has been reviewed and separated into ten individual parts.

A list of all parts in the ISO 16073- series can be found on the ISO website.

Introduction

This International Standard provides minimum performance requirements for wildland firefighters' personal protective equipment (PPE) Firehoods, designed for use for extended periods during wildland firefighting.

Wildland firefighting involves work carried out mostly in summer temperatures and for many hours, during which the firefighter can develop high levels of metabolic heat. As a consequence, the PPE is required to be light, flexible and commensurate with the risks to which the firefighter can be exposed in order to be effective without introducing excessive heat stress to the wearer.

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

Nothing in this International Standard is intended to restrict any jurisdiction, purchaser or manufacturer from exceeding these acceptable performance requirements.

It is intended that a risk assessment be undertaken to determine if the PPE covered by this International Standard is suitable for its intended use and the expected exposure.

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Wildland firefighting personal protective equipment — Requirements and test methods —

Part 9: Firehoods

1 Scope

This International Standard specifies the minimum performance requirements and methods of test for Firehoods that cover the head and neck and are used for wildland firefighting. An optional requirement has been included to provide limited protection against particulate contaminants

This International Standard covers the general design of the PPE, the minimum levels of performance for the materials employed and the methods of test used. This PPE is not intended to provide protection during fire entrapment.

This document does not cover PPE for structural firefighting (see ISO 11999-9). This standard only applies in situations when compatible protective clothing, helmet, and when necessary respiratory protection devices are also worn.

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 139, *Textiles — Standard atmospheres for conditioning and testing*

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

ISO 3175-1, *Textiles — Professional care, drycleaning and wetcleaning of fabrics and garments — Part 1: Assessment of performance after cleaning and finishing*

ISO 5077, *Textiles — Determination of dimensional change in washing and drying*

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

ISO 6942, *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 8559-1:2017, *Size designation of clothes — Part 1: Anthropometric definitions for body measurement*

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

ISO 11092, *Textiles — Physiological effects — Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test)*

ISO 13688:2013, *Protective clothing — General requirements*

ISO 13938-2, *Textiles — Bursting properties of fabrics — Part 2: Pneumatic method for determination of bursting strength and bursting distension*

ISO 14116:2015, *Protective clothing — Protection against flame — Limited flame spread materials, material assemblies and clothing*

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

ISO 16900-3:2012, *Respiratory protective devices — Methods of test and test equipment — Part 3: Determination of particle filter penetration*

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*

3 Terms and definitions

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

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

4 General design requirements

4.1 General

Materials used in the construction of the firehood which are likely to come into contact with the skin of the wearer shall comply with the innocuous clause 4.2 of ISO 13688:2013.

4.2 Flexibility

The firehood shall have flexibility to take up the shape of the wearer's head without discomfort and shall not restrict head movement.

The firehood shall fit around or under the respiratory protection devices for which compatibility is claimed without reducing the field of view interfering with the breathing function of the mask and give no discomfort to the wearer.

The design requirements specified shall be verified by visual inspection during the procedures in Annex A. The manufacturer shall provide information on the specific items for those that compatibility is claimed.

NOTE For more information on compatibility, see ISO/TS 11999-2.

4.3 Facial opening

The firehood shall have a facial opening designed to fit around or under any eye or respiratory protection being worn. The performance of eye or respiratory protection shall not be compromised when the firehood is worn. Compatibility shall be assessed by visual observation. NOTE For more information on compatibility, see ISO/TS 11999-2.

4.4 Yoke interface area

The firehood shall have a yoke creating an interface area with protective clothing (ISO 16073-3), the integrity of which shall be maintained.

NOTE For more information on compatibility, see ISO/TS 11999-2.

4.5 Sizing

The firehood may be manufactured in various sizes. It shall be sufficiently elastic to be compatible with various head sizes and shapes. Assess by visual inspection.

NOTE 1 Overstretching will reduce the heat protective performance of the firehood and should be avoided by design. Excess material in the construction of the firehood may hamper the wearer and compromise the wearing of other personal protective equipment.

NOTE 2 The yoke is not always symmetrical on the back, upper shoulders and front (upper chest)

4.6 Seam construction

Seams shall be constructed to given minimum loss of strength and protection and to maintain the temperature resistance and the integrity of the fire hood meeting the requirements of 6.2 and 6.7. Also assess by visual observation after Annex A.

4.7 Labels

The label(s) for the marking requirement shall be positioned in the area defined as the yoke of the firehood. Assess by visual inspection.

4.8 Particulate protection (Optional)

The firehood shall meet the requirements in 6.9 and the requirements in this sub-clause.

The particulate protection surface shall include at least the area from 50 mm below the side of the neck point, and from 100 mm below both the front of the neck point and back of the neck point up to the top of the head as defined in ISO 8559-1, but may exclude the area indicated in 4.6.

The elastic and stitching around the facial opening shall be permitted to exclude particulate blocking material specifically for meeting the requirements of 4.2 for a distance of 50 mm from the leading edge of the firehood face opening to the innermost row of stitching.

The distance shall be checked in at least 6 locations with the firehood lying on a flat surface with the face opening facing upwards.

If the requirements of this sub-clause are met, add on the label wording equivalent to "This firehood provides limited particulate protection (see also 7.3h)).

5 Pretreatment and sampling

5.1 Sampling

A sample shall be taken, which is representative of the materials used to construct the garment taking into account whether 4.9 applies.

5.2 Washing

Where specified, cleaning shall be performed in accordance with ISO 6330 using the front loading horizontal drum machine and reference detergent 3 (ECE reference detergent 98).

Washing shall be carried out in accordance with procedure 6N (60 ± 3) °C and drying by procedure F (machine Type A1) exhaust temperature normal (minimum 40 °C, maximum 80 °C), unless otherwise specified in the care labelling.

A laundry bag shall not be used.