



International Standard

ISO 11999-1

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 1: General

*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 1: Généralités

**Second edition
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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	2
3.1 Terms and definitions	2
3.2 Abbreviated terms	2
3.3 Subscripts	3
4 Design and performance requirements for PPE items and ensembles	3
4.1 General	3
4.2 Innocuousness	3
4.3 Items of PPE, combinations and ensembles	3
5 Marking	3
5.1 General	3
5.2 Compliance marking requirements for an item of PPE	4
5.3 Additional marking for compatibility	4
6 Information supplied	4
6.1 Information to be supplied by the manufacturer	4
6.2 Manufacturer instructions for use	5
7 Compatibility instructions	5
Bibliography	7

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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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*.

This second edition of ISO 11999-1, together with ISO/TS 11999-2 to ISO 11999-10, cancels and replaces ISO 11999-1:2015, which has been technically revised.

The main changes are as follows:

- the content has been revised with a focus on single performance requirements;
- performance requirements for respiratory protection are covered in ISO 17420-5.

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.

Introduction

In a world where there is an ever-increasing focus on worker occupational health and safety, Fire services are faced with the dilemma of trying to provide firefighters with as safe a work environment as is reasonably possible whilst also having to deal with the known and unknown risks our firefighters face whilst fighting fires in both the urban and wildland environments.

In the course of their duty's firefighters are exposed to many hazardous chemicals that include smoke, soot, carcinogens and the biproducts of combustion such as heavy metals, benzene and per-fluorinated compounds which are regularly inhaled and/or deposited on the skin of firefighters.

With the recent statement by the World Health Organization (WHO) elevating the classification of occupational exposure as a firefighter to Group 1, ISO TC94/SC 14 Working Group on contaminants are taking all possible steps to reduce the exposures to firefighters by reviewing all standards pertaining to PPE used by firefighters and making recommendations to address identified shortfalls.

The following is an extract from the statement released by the WHO:

- International Agency for Research on Cancer (IARC), the cancer agency of the World Health Organization (WHO), has evaluated the carcinogenicity of occupational exposure as a firefighter.
- A Working Group of 25 international experts, including 3 Invited Specialists, from 8 countries was convened by the IARC Monographs program for a meeting in Lyon.
- After thoroughly reviewing the available scientific literature, the Working Group classified occupational exposure as a firefighter as carcinogenic to humans (Group 1), on the basis of sufficient evidence for cancer in humans."

This document specifies minimum design and performance requirements for personal protective equipment (PPE) worn by firefighters to reduce injury and loss of life whilst fighting fires occurring in structures. Amongst other hazards faced by firefighters is exposure to high thermal loads, including flames, particulates, and other hazardous chemicals. Additional information may also be found in ISO 20345 and ISO 21420.

This document details minimum design and performance requirements for the various items of PPE covered in each part and provides information regarding compatibility between these items of PPE when worn together.

ISO 11999-2, specifies design and performance requirements to achieve compatibility across the PPE covered in ISO 11999-3 to ISO 11999-10 when all the items are worn together, thereby creating a PPE ensemble, whether sold by a manufacturer or composed by a user. In either case, the PPE ensemble should meet the requirements of ISO 11999-2. This becomes significantly important when considering the issue of particulate protection and potential health risks posed to firefighters from exposure to products of combustion.

All items are also required to meet general requirements for marking and manufacturer's instructions (this document), as well as specific marking and manufacturer's instructions within each of the respective parts of ISO 11999. In the case of an ensemble, each item of PPE should also be marked according to ISO 11999-2.

ISO/TR 21808 provides guidance on how to carry out a risk assessment, the guideline was developed previously based on the work of CEN Technical Committee TC 162, Joint Working Group for firefighters Personal Protective Equipment and has been modified to encompass PPE worn by all emergency service personnel. (CEN/TC 162/JWG FFPPE N 52 "Risk assessment guidelines for choosing the PPE for firefighters").

During incidents being undertaken by emergency service personnel, many different hazards may be encountered, including exposures to a range of chemicals that are biproducts of fires occurring in the urban and wildland environment. Where possible, the level of risk that each hazard presents to firefighters should be eliminated or reduced to an acceptable level. The guidance given in ISO/TR 21808 indicates how to carry out a Risk Assessment by acknowledging the hazards that may be present, the likelihood of the firefighters becoming exposed to them and possible consequence of such exposure if not addressed. Where hazards are identified and cannot be removed from a workplace, the items of PPE selected to protect personnel should be fit for their intended use while allowing personnel to carry out the work required of them. In environments