

BRITISH STANDARD

**Personal protective
equipment for
firefighters –
Assessment of ergonomic
performance and
compatibility –
Requirements and test
methods**

ICS 13.220; 13.340



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This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 44, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 31 May 2007. It was prepared by Technical Committee PH/14, *Firefighters' Personal Protective Equipment*. A list of organizations represented on this committee can be obtained on request to its secretary.

Relationship with other publications

This standard reflects the guidance in BS EN 13921¹⁾ on applying ergonomic principles for personal protective equipment (PPE).

This standard complements the existing range of British Standards that exist for individual items of PPE by providing a method of testing the individual items as an ensemble.

Attention is drawn to the following statutory regulations.

- [1] The Personal Protective Equipment Regulations 2002.
- [2] The Personal Protective Equipment at Work Regulations 1992 (as amended).

Information about this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

WARNING. This British Standard calls for the use of substances and/or procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall". Apparatus items can also be in italic type, but will be of normal text size, unlike informative material, such as notes.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

¹⁾ In preparation.

Introduction

The potentially severely adverse environments in which firefighters can be called upon to operate, present considerable challenges in protecting the firefighter. The personal protective equipment (PPE) provided by employers offers a high degree of technical performance thereby helping to minimize the risk of injuries.

Almost by definition, any item of PPE introduces a barrier between part or parts of the body and the external environment. Whilst this barrier is essential for protecting the body, it has long been recognized that this can have unwanted side-effects on the wearer in terms of imposing additional physical workload, hindering movement, impairing sensory perception or in some cases causing considerable discomfort. Such side-effects can reduce the efficiency of task performance and/or encourage the user not to wear the PPE correctly thereby impairing the level of protection afforded.

This problem has been recognized in legislation. The EC Directive on personal protective equipment [3] enacted in the UK by The Personal Protective Equipment Regulations 2002 [1] places duties on PPE manufacturers to take account of ergonomic requirements, whilst the associated EC Directive on the use by workers of personal protective equipment at the workplace [4] enacted in the UK by The Personal Protective Equipment at Work Regulations 1992 (as amended) [2] places similar duties on employers providing PPE for use.

To facilitate compliance with such legislation, European technical product standards for individual items of PPE are gradually introducing tests for ergonomic characteristics. However, such standards are for testing individual products and seldom include the assessment of interactions with other items of PPE except in isolated cases (e.g. helmet-mounted ear-muffs conforming to BS EN 352-3) where they are an essential element of their use.

This standard has therefore been prepared to enable firefighters' PPE ensembles to be evaluated and objectively assessed for ergonomic performance as a complete ensemble, rather than in their component parts. The general approach and the testing methodology included here have been developed under the DTI Consultancy Drafting Scheme, and incorporate practical experience gained during a major contemporary assessment of firefighters' PPE ensembles. The content of this standard has largely been developed against the background of the needs of PPE for structural firefighting ensembles but it might be applicable to PPE ensembles utilized in other circumstances, e.g. wildland firefighting. It is anticipated that it will be used by the Fire and Rescue Service and other firefighting organizations in evaluating their existing ensembles, proposed changes to individual items of PPE within these ensembles, or potential replacement ensembles, against a set of performance parameters derived from this standard.

Manufacturers or consortia can also use this standard to ensure or demonstrate the usability of combinations of their products.

In either case, the assistance of suitably qualified and competent thermal physiologists/ergonomists will be required to both develop the performance parameters, and to assess the results of these trials against those parameters.