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Protective clothing — Clothing to protect against heat and flame — Minimum performance requirements

*Vêtements de protection — Vêtements de protection contre la chaleur
et les flammes — Exigences de performance minimales*



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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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

The committee responsible for this document is ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 13, and by Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets* in collaboration.

This third edition cancels and replaces the second edition (ISO 11612:2008), of which it constitutes a minor revision with the following changes:

- modify clause in design requirements regarding garment overlaps;
- modify clause in design requirements regarding the areas of the body covered by protective suits;
- modify clause on sampling requirements;
- modify clause for ageing due to washing (maximum number of cleaning procedures as indicated by the manufacturer);
- modify pre-treatment clause to include requirements for single-use garments;
- include new requirement for measuring property value for rating and classification;
- modify requirement for optional heat resistance testing at 260 °C;
- remove reference to melting from flame spread requirements;
- modify afterflame requirement for flame spread;
- modify afterglow requirement for flame spread;
- modify requirement that hardware is tested only after pre-treatment;
- include statement for flame spread testing in regard to interlining materials;
- modify test procedure for the flame testing of labels, badges, and retro-reflective materials;
- modify requirements for tear strength;

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- specify test area for burst strength testing;
- modify innocuousness clause to include reference to ISO 13688;
- specify limit for Chromium(VI) Content;
- include new table for summary of tests;
- modify clause for information to be supplied by the manufacturer;
- include new Annex for measuring property value for rating and classification;
- update observation clause in [Annex C](#), prediction of burn injury using an instrumented manikin;
- include new definition for uncertainty of measurement, [Annex E](#).

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Introduction

The purpose of this International Standard is to provide minimum performance requirements for clothing to protect against heat and flame, which could be worn for a wide range of end uses. All the other standards listed in this Introduction deal also with clothing to protect against heat and flame, but rather for quite specific products or end uses.

Within many of the hazards listed in this International Standard there are three performance levels:

- Level 1 to indicate exposure to low risk;
- Level 2 to indicate exposure to medium risk;
- Level 3 to indicate exposure to high risk.

For protection against extreme exposures to radiant heat, there is a fourth performance level to take into account, high performance materials such as aluminized and similar materials. The level of personal protection to be provided is based on the outcome of the risk assessment and some comments on risk assessment are given in [Annex D](#).

For complete protection against exposure to heat and/or flame, it is probable that it will be necessary to protect the head, face, hands, and/or feet with suitable Personal Protective Equipment (PPE) and in some cases, appropriate respiratory protection might also be considered necessary.

Attention is drawn to ISO/TR 2801:2007 [\[\[1\]\]](#), which sets out guidelines for selection, use, care, and maintenance of protective clothing against heat and flame.

Nothing in this International Standard is intended to restrict any jurisdiction, purchaser, or manufacturer from exceeding these minimum requirements. It is one of several standards for clothing that have been developed to protect persons against heat and/or flames. Other standards include:

- ISO 11611, *Protective clothing for use in welding and allied processes*;
- ISO 11613, *Protective clothing for firefighters — Laboratory test methods and performance requirements*;
- ISO 14460, *Protective clothing for automobile racing drivers — Protection against heat and flame — Performance requirements and test methods*;
- ISO 15384, *Protective clothing for firefighters — Laboratory test methods and performance requirements for wildland firefighting clothing*;
- ISO 15538, *Protective clothing for firefighters — Laboratory test methods and performance requirements for protective clothing with a reflective outer surface*;
- EN 469, *Protective clothing for firefighters — Performance requirements for protective clothing for firefighting*;
- EN 1486, *Protective clothing for fire-fighters — Test methods and requirements for reflective clothing for specialized fire fighting*;
- EN 13911, *Protective clothing for firefighters — Requirements and test methods for fire hoods for firefighters*;
- EN 15614, *Protective clothing for firefighters — Laboratory test methods and performance requirements for wildland clothing*.