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Beskyttelsesbeklædning til brandmænd – Krav til ydeevne for beskyttelsesbeklædning beregnet til brandbekæmpelse

Protective clothing for firefighters – Performance requirements
for protective clothing for firefighting activities

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EUROPÄISCHE NORM

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ICS 13.340.10

Supersedes EN 469:2005

English Version

Protective clothing for firefighters - Performance requirements for protective clothing for firefighting activities

Habillement de protection pour sapeurs-pompiers
- Exigences de performance pour les vêtements
de protection pour la lutte contre l'incendie

Schutzkleidung für die Feuerwehr -
Leistungsanforderungen für Schutzkleidung
für Tätigkeiten der Feuerwehr

This European Standard was approved by CEN on 29 June 2020.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document ([EN 469:2020](#)) has been prepared by Technical Committee CEN/TC 162 "Protective clothing including hand and arm protection and lifejackets", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2021, and conflicting national standards shall be withdrawn at the latest by January 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes [EN 469:2005](#).

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Regulation (EU) 2016/425.

For relationship with EU Regulation, see informative [Annex ZA](#), which is an integral part of this document.

[Annex F](#) provides details of significant technical changes between this European Standard and the previous edition. [Annex G](#) provides a rationale for the decisions on the requirements of this document.

It is one of several standards for protective clothing that have been developed to protect persons against heat and/or flames.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

The clothing as defined in this document is part of the broader protection system that the wearer uses to protect against risks which they are likely to be exposed to. Additional personal protective equipment (PPE) to protect the head, face, hands and feet should also be worn, along with appropriate respiratory protection where necessary.

The use of the PPE can affect the feelings perceived through our senses. Also, the PPE can have a paradoxical effect (e.g. heat stress vs thermal protection) in the daily activities of a firefighter.

Although the firefighter role is to extinguish fires, he/she has many other activities where little or no thermal protection is required. Therefore, finding the balance between thermal protection and comfort (e.g. avoidance of heat stress), as well as other potential requirements is key. This revised document gives the fire service options, based on a risk assessment, to make choices that match their specific requirements and circumstances.

The heat and flame risks have been split into two levels. Level 2 provides higher thermal protection performance, expected in high risk activities such as fighting fires in structures, e.g. buildings, factories, gas stations.

This document applies to the design, manufacturing, testing and certification of firefighting protective clothing. During the revision of the standard, the performance specification of current PPE purchased across Europe by many fire services was reviewed. In addition, a list and a rationale for the inclusion of each requirement (new and old) or the changing of existing requirements has been provided in Annexes F and G.

It is essential that the fire (and rescue) services or their employers carry out a risk assessment and carry out a compatibility and ergonomics check of all parts of the PPE (SCBA, gloves, boots, etc.) to meet the requirements of the Regulation (EU) 2016/425. It is essential that firefighters and maintenance personnel are trained in the selection, use, care and maintenance of all personal protective equipment. Guidelines for selection, use, care and maintenance of protective clothing against heat and flame are given in [CEN/TR 14560:2018](#) (Annex C).

There is an increased focus on the contamination of firefighters and/or their PPE from smoke particulates and fire gases, as well as all the decontamination processes. This document includes an [Annex B](#) to alert firefighters and provide some recommendations.

Although innovation like sensors techniques is fully in development, this document provides opportunities for implementation by describing the interfaces areas.

Nothing in this document is intended to restrict any jurisdiction, purchaser or manufacturer from exceeding these minimum requirements.

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Protective clothing for firefighters – Performance requirements for protective clothing for firefighting activities

1 Scope

This document specifies minimum performance requirements for protective clothing designed to be worn during firefighting activities. The requirements detailed in this document cover design, heat and flame, mechanical, chemical, comfort, and visibility.

This document covers the general clothing design, the minimum performance levels of the material used, the methods of test to be used to determine these performance levels, marking and information supplied by the manufacturer.

This document makes distinction between firefighting activities dividing them into two performance levels based on a risk assessment:

- **Level 1:** specifies the minimum requirements for firefighting clothing involving work associated with outdoor firefighting and their support activities, taking into account the environments and conditions of the expected operational scenarios of such firefighting activities.

The level 1 is not applicable for protection against risks encountered in fighting fires or rescue from fire activities in structures, unless combined to a level 2 or other specialized PPE.

- **Level 2:** specifies the minimum requirements for firefighting clothing for risks encountered in fighting fires and rescue from fire in structures.

The distinction between Level 1 and Level 2 clothing is restricted to the requirements for heat and flame (X1 or X2 - Heat and Flame). These levels of protection can be reached by a single garment or a combination of separate garments.

Additional marking provides two grades of protection for Y (protection against water penetration) and Z (water vapour resistance). It is essential that these performance grades are indicated on the marking of the clothing and explained in the instructions for use.

This document does not cover protective clothing for wildland firefighting, specialized firefighting in a high amount of radiant heat where reflective clothing is required and/or advanced technical rescue operations dealing with hazardous chemicals, working with chainsaws and water and rope rescue.

This document does not cover protection for the head, hands and feet or specific protection against other hazards e.g. chemical, biological, radiological and electrical hazards. These aspects may be covered in other European Standards.

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.

[CEN/TR 14560:2018](#), *Guidance for selection, use, care and maintenance of protective clothing against heat and flame*

[EN ISO 811:2018](#), *Textiles - Determination of resistance to water penetration - Hydrostatic pressure test (ISO 811:2018)*

[EN ISO 1421:2016](#), *Rubber- or plastics-coated fabrics - Determination of tensile strength and elongation at break (ISO 1421:2016)*

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[EN ISO 3146:2000](#), *Plastics - Determination of melting behaviour (melting temperature or melting range) of semi-crystalline polymers by capillary tube and polarizing-microscope methods (ISO 3146:2000)*

[EN ISO 4674-1:2016](#), *Rubber- or plastics-coated fabrics - Determination of tear resistance - Part 1: Constant rate of tear methods (ISO 4674-1:2016)*

[EN ISO 6530:2005](#), *Protective clothing - Protection against liquid chemicals - Test method for resistance of materials to penetration by liquids (ISO 6530:2005)*

[EN ISO 6942:2002](#), *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 6942:2002)*

[EN ISO 9151:2016](#), *Protective clothing against heat and flame - Determination of heat transmission on exposure to flame (ISO 9151:2016, Corrected version 2017-03)*

[EN ISO 11092:2014](#), *Textiles - Physiological effects - Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test) (ISO 11092:2014)*

[EN ISO 12127-1:2015](#), *Clothing for protection against heat and flame - Determination of contact heat transmission through protective clothing or constituent materials - Part 1: Contact heat produced by heating cylinder (ISO 12127-1:2015)*

[EN ISO 13506-1:2017](#), *Protective clothing against heat and flame - Part 1: Test method for complete garments - Measurement of transferred energy using an instrumented manikin (ISO 13506-1:2017)*

[EN ISO 13688:2013](#), *Protective clothing - General requirements (ISO 13688:2013)*

[EN ISO 13934-1:2013](#), *Textiles - Tensile properties of fabrics - Part 1: Determination of maximum force and elongation at maximum force using the strip method (ISO 13934-1:2013)*

[EN ISO 13935-2:2014](#), *Textiles - Seam tensile properties of fabrics and made-up textile articles - Part 2: Determination of maximum force to seam rupture using the grab method (ISO 13935-2:2014)*

[EN ISO 13937-2:2000](#), *Textiles - Tear properties of fabrics - Part 2: Determination of tear force of trouser-shaped test specimens (Single tear method) (ISO 13937-2:2000)*

[EN ISO 14116:2015](#), *Protective clothing - Protection against flame - Limited flame spread materials, material assemblies and clothing (ISO 14116:2015)*

[EN ISO 15025:2016](#), *Protective clothing - Protection against flame - Method of test for limited flame spread (ISO 15025:2016)*

[EN ISO 20471:2013](#),¹⁾ *High visibility clothing - Test methods and requirements (ISO 20471:2013, Corrected version 2013-06-01)*

[ISO 17493:2016](#), *Clothing and equipment for protection against heat - Test method for convective heat resistance using a hot air circulating oven*

1) Impacted by EN ISO 20471:2013/A1:2016.