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Nadomešča:
SIST EN 469:2006
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Zaščitna obleka za gasilce - Zahtevane lastnosti za zaščitno obleko pri gašenju požara

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

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

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

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13.220.10	Gašenje požara	Fire-fighting
13.340.10	Varovalna obleka	Protective clothing

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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

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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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of an identical text or by endorsement, at the latest by January 2021, and conflicting national standards shall be withdrawn at the latest b January 2021.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.

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.

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)*

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.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/ui

3.1
ankle
region where the foot and the leg meet and can be marked by lateral and medial malleolus (A malleolus is the bony prominence on each side of the ankle)

3.2
anti-wicking barrier
material used to prevent the transfer of liquid from outside the garment to inside the garment, usually in addition to or replacing part of the innermost lining at the edge(s)

3.3
cleaning
process by which an item of personal protective equipment (PPE) is made again serviceable and/or hygienically wearable by removing any dirt or contamination

Note 1 to entry: Cleaning may include reimpregnation step.

3.4
cleaning cycle
washing plus drying or dry-cleaning cycle

Note 1 to entry: See 3.32 (pre-treatment)

3.5
closure system
method of fastening openings in the garment including combinations of more than one method of achieving a secure closure

Note 1 to entry: This term does not cover seams.

3.6
(firefighter's protective) clothing
specialized garments providing protection for the firefighter’s torso, neck, arms, and legs, but excluding the head, hands, and feet

3.7
compatibility
ability of clothing (protective clothing and other clothing) to be used in conjunction with other types of PPE covering other parts of the body

3.8
component assembly
combination of all materials of a multi-layer garment presented exactly as the finished garment construction

3.9
conditioning
keeping samples under standard conditions of temperature and relative humidity for a minimum period of time

[SOURCE EN ISO 11612:2015]

3.10
device
item whether made of fabric or hardware that is integrated into the firefighter garment

3.11
drain mesh material
permeable material to allow drainage of water

3.12
flame heat transfer index 12
HTI_{12}
time in seconds expressed to one decimal place, to achieve a calorimeter temperature rise of (12±0,1) °C

3.13
flame heat transfer index 24
HTI_{24}
time in seconds expressed to one decimal place, to achieve a calorimeter temperature rise of (24±0,1) °C

3.14
garment
single item of clothing which may consist of single or multiple layers

3.15
garment assembly
series of layers of garments arranged in the order as worn, which may contain multilayer materials, material combinations or a series of separate garments in single layers

3.16
hardware
non-fabric items used in protective clothing including those made of metal or plastic

EXAMPLE Fasteners, rank markings, buttons, zippers, embroideries, braces.

[SOURCE EN ISO 11612:2015]

3.17
re-impregnation
procedure to maintain or regain the repellent properties of the outer fabric and/or chemical penetration resistance of the clothing

3.18
innermost lining
lining on the innermost face of a component assembly which is intended to be nearest to the wearers skin

Note 1 to entry: Where the innermost lining forms part of a material combination, the material combination is regarded as the innermost lining.

3.19
integrated
one or more additional elements attached to the garments functioning as an inseparable whole or a detachable device (3.10)

3.20
interface area
areas where openings interrupt the continuity of material(s) or garments

3.21
interlining
layer between the outermost layer and the innermost lining in a multilayer garment

3.22
laundering
process intended to remove soils and/or stains by treatment (washing) with an aqueous detergent solution and normally including rinsing, extracting and drying

[SOURCE: EN ISO 15487:2010]

3.23
material
substances, excluding hardware and labels, of which an item of clothing is made

3.24
material combination
material produced from a series of separate layers, fixed together during the garment manufacturing stage

Note 1 to entry: See 3.26 (multilayer material).

3.25
moisture barrier
fabric or membrane used in a component assembly to achieve the properties of hydrostatic pressure and water vapour permeability

Note 1 to entry: Moisture barriers do not prevent the passage of some chemical, biological or radiological agents and appropriate personal protective equipment (PPE) should be provided to protect the wearer in such incidents.

3.26
multilayer material
material consisting of different layers intimately combined prior to the garment manufacturing stage, e.g. by weaving, quilting, coating or gluing

Note 1 to entry: See 3.24 (material combination).