



SLOVENSKI STANDARD

SIST EN 469:2006

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Nadomešča:
SIST EN 469:1996

Zaščitna obleka za gasilce – Zahtevane lastnosti za zaščitno obleko pri gašenju požara

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

Schutzkleidung für die Feuerwehr - Leistungsanforderungen für Schutzkleidung für die Brandbekämpfung

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

Ta slovenski standard je istoveten z: EN 469:2005

ICS:

13.220.10	Gašenje požara	Fire-fighting
13.340.10	Varovalna obleka	Protective clothing

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EUROPEAN STANDARD
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English Version

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

Vêtements 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 die
Brandbekämpfung

This European Standard was approved by CEN on 22 July 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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EN 469:2005 (E)

Foreword

This European Standard (EN 469:2005) 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of an identical text or by endorsement, at the latest by March 2006, and conflicting national standards shall be withdrawn at the latest by March 2006.

This European Standard supersedes EN 469:1995.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this European Standard.

It is one of several standards for clothing that have been developed to protect persons against heat and/or flames. Some examples of other European Standards include:

- prEN ISO 11611:2003, Protective clothing for use in welding and allied processes (ISO/DIS 11611:2003);
- prEN ISO 11612:2003, Clothing to protect against heat and flame (ISO/DIS 11612:2003);
- ISO 11613:1999, Protective clothing for firefighters — Laboratory test methods and performance requirements;
- EN 1486:1996, Protective clothing for firefighters — Test methods and requirements for reflective clothing for specialized fire fighting;
- EN ISO 14460:1999 (and EN ISO 14460/A1:2002), Protective clothing for automobile racing drivers — Protection against heat and flame — Performance requirements and test methods (ISO 14460:1999);
- ISO 15384:2003, Protective clothing for firefighters — Laboratory test methods and performance requirements for wildland firefighting clothing;
- ISO 15538:2001, Protective clothing for firefighters — Laboratory test methods and performance requirements for protective clothing with a reflective outer surface;
- EN 13911:2004, Protective clothing for firefighters — Requirements and test methods for fire hoods for firefighters.

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

Introduction

The purpose of this European Standard is to provide minimum performance requirements for protective clothing for firefighters, whilst fighting fires. Within this European Standard, two performance levels are given for performance requirements 6.2, 6.3, 6.11 and 6.12 - level 1 is the lower level, level 2, the higher level. The level of personal protection chosen should be based on the outcome of a risk assessment. Annex G lists many of the hazards that may be encountered by firefighters and sets out guidelines for carrying out a risk assessment analysis.

During an incident, hazards other than those against which clothing to this European Standard is intended to protect may be encountered e.g. chemical, biological, radiological, and electrical. If the risk assessment identifies that exposure to such hazards is likely, protection by more appropriate personal protective equipment may be required either instead of or in addition to the protective clothing covered by this European Standard.

In this European Standard, some requirements have an influence on ergonomics and additional informative annexes on ergonomic features and physiological / heat stress hazards are included in the form of guidelines because suitable tests for these requirements have not yet been validated internationally. It is important that further requirements for ergonomic aspects of protective clothing become integrated normative parts of European standards such as this and currently work on this is taking place.

The requirement regarding water vapour resistance in 6.12, level 1, is proposed for an amendment (procedure).

For adequate overall protection against the risks to which firefighters are likely to be exposed, additional personal protective equipment to protect the head, face, hands and feet should also be worn, along with appropriate respiratory protection where necessary.

The specified controlled laboratory tests used to determine compliance with the performance requirements of this European Standard do not replicate the situations to which firefighting personnel may be exposed.

This European Standard sets minimum levels of performance requirements. Nothing in this European Standard is intended to restrict any jurisdiction, purchaser or manufacturer from exceeding these minimum requirements.

NOTE It is essential that firefighters are trained in the selection, use, care and maintenance of all personal protective equipment. Attention is drawn to CEN/TR 14560:2003, which sets out guidelines for selection, use, care and maintenance of protective clothing against heat and flame.

EN 469:2005 (E)**1 Scope**

This European Standard specifies minimum levels of performance requirements for protective clothing to be worn during firefighting operations and associated activities such as e.g. rescue work, assistance during disasters. The described clothing is not meant to protect against deliberate chemical and/or gas cleaning operations.

This European Standard covers the general clothing design, the minimum performance levels of the materials used, and the methods of test to be used to determine these performance levels. The required performance levels may be achieved by the use of one or more garments.

This European Standard covers the event of an accidental splash of chemical or flammable liquids but does not cover special clothing for use in other high-risk situations e.g. reflective protective clothing. It does not cover protection for the head, hands and feet or protection against other hazards e.g. chemical, biological, radiological and electrical hazards. These aspects may be covered in other European Standards.

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2 Normative References

The following referenced documents are indispensable for the application of this European Standards For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 340, *Protective Clothing — General requirements*

EN 367, *Protective clothing — Protection against heat and fire — Method of determining heat transmission on exposure to flame*

EN 471:2003, *High-visibility warning clothing for professional use — Test methods and requirements*

EN 533:1997, *Protective clothing — Protection against heat and flame — Limited flame spread materials and material assemblies*

EN 20811, *Textiles — Determination of resistance to water penetration — Hydrostatic pressure test*

EN 24920:1992, *Textiles — Determination of resistance to surface wetting (spray test) of fabrics*

EN 31092, *Textiles — Determination of physiological properties — Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded - hotplate test) (ISO 11092:1993)*

EN ISO 1421:1998, *Rubber- or plastics — Determination of tensile strength and elongation at break (ISO 1421:1998)*

EN ISO 4674-1:2003, *Rubber- or plastics-coated fabrics - Determination of tear resistance - Part 1: Constant rate of tear methods (ISO 4674-1:2003)*

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 13934-1:1999, *Textiles — Tensile properties of fabrics — Part 1: Determination of maximum force and elongation at maximum force using the strip method (ISO 13934-1:1999)*

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 15025:2002, *Protective clothing — Protection against heat and flame — Method of test for limited flame spread (ISO 15025:2000)*

ISO 5077, *Textiles — Determination of dimensional change in washing and drying*

ISO 7941, *Commercial propane and butane — Analysis by gas chromatography*

ISO 17493:2000, *Clothing and equipment for protection against heat — Test method for convective heat resistance using a hot air circulating oven*

CIE 54.2:2001, *Retroreflection — Definition and measurement*

3 Terms and definitions

For the purposes of this European Standard, the following definitions apply.

EN 469:2005 (E)**3.1****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 moisture barrier at the edge(s)

3.2**closure system**

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

NOTE This term does not cover seams.

3.3**complete garment assembly**

all materials that form the complete garment

3.4**component assembly**

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

3.5**firefighters' protective clothing**

specific garments providing protection for the firefighter's torso, neck, arms, and legs, but excluding the head, hands, and feet

3.6**garment**

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

3.7**hardware**

non-fabric items used in protective clothing including those made of metal or plastic, e.g. fasteners, rank markings, buttons, zippers

3.8**innermost layer**

innermost material of the complete garment assembly which is intended to be nearest to the wearers skin

3.9**innermost lining**

lining on the innermost face of a component assembly which is intended to be nearest to the wearers skin. Where the innermost lining forms part of a material combination, the material combination shall be regarded as the innermost lining

3.10**interlining**

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

3.11**material**

substances excluding hardware, of which an item of clothing is made

3.12**material combination**

material produced from a series of separate layers, intimately combined prior to the garment manufacturing stage, e.g. a quilted fabric

3.13**moisture barrier**

fabric or membrane used in a complete garment assembly to achieve the properties of hydrostatic pressure and water vapour permeability

NOTE Moisture barriers might 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.

3.14

multilayer clothing assembly

series of garments arranged in the order as worn. It may contain multilayer materials, material combinations or a series of separate garments in single layers

3.15

outer garment

outermost part of the clothing that will be exposed to the hazard(s)

3.16

outer material

outermost material of which the item of protective clothing is made

3.17

seam

permanent fastening between two or more pieces of material

3.18

structural seam

seam which holds the outer garment together and which if broken would expose the under garments and reduce protection

3.19

torso

trunk of the human body, i.e. without arms, legs and head

3.20

wristlet

elastic part of the sleeves that covers the wrist tightly

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4 General clothing design

4.1 General

The levels of performance specified in this European Standard may be achieved by the use of a garment or a multilayer clothing assembly, which may contain material combinations, or component assemblies.

4.2 Size designation

Size designation shall be in accordance with the requirements of EN 340.

4.3 Type of clothing

Protective clothing for firefighters shall provide protection for the firefighters torso, neck, arms to the wrists, and legs to the ankles during firefighting activities. It does not cover protection for the head, hands and feet or protection against other hazards e.g. chemical, biological, radiological and electrical hazards.

4.4 Combination of garments

Where protection to the requirements of this European Standard is provided by more than one garment, each garment in the clothing assembly shall be marked in accordance with the requirements of this European Standard(see 7.3).

EN 469:2005 (E)**4.5 Outer two piece suit**

Where protection to the requirements of this European Standard is provided by an outer two piece suit, it shall be determined that an overlap between the jacket and trouser shall always remain whilst carrying out the job related exercises during ergonomic and practical performance testing (see e.g. EN 340 and Annex D) whatever the position of the body parts or the movements are during those exercises.

4.6 Anti-wicking barrier

Where an anti-wicking barrier is used in a garment either as part of an interlining at the edge part of a moisture barrier or as the edge part of an innermost lining e.g. at the end of the sleeves, the trouser legs or bottom of a jacket, the material shall at least meet the requirements of the moisture barrier according to 6.11. Further the component assembly including the anti-wicking barrier shall meet the requirements of 6.1, 6.2, and 6.3.

4.7 Hardware

Hardware penetrating the outer material shall not be exposed on the innermost surface of the component assembly.

4.8 Integrated personal protective equipment (PPE)

When PPE for other type of protection (e.g. against falls from a height) is integrated in the clothing assembly they shall meet the requirements set for these type of PPE. The interface shall not decrease the protection level achieved by the clothing assembly.

5 Sampling and pre-treatment

5.1 The number and size of specimens for the different tests shall be in accordance with the respective European Standards.

5.2 Before testing for the requirements in Clause 6, except for the tests in 6.5, 6.6, 6.7, 6.13, 6.14, and 6.15, the test materials shall be washed and dried or dry-cleaned according to the instructions of the care labelling and the manufacturer's instructions. Materials shall be conditioned for 24 h at (20 ± 2) °C and (65 ± 5) % relative humidity before testing. Testing shall begin within 10 min after removing the specimen from the standard atmosphere.

5.3 Component assembly or multilayer component assembly are tested with the outermost surface exposed, except for flame spread testing of innermost lining (6.1). Unless otherwise specified in the test standard, the test shall be carried out in laboratory conditions at a temperature of (20 ± 3) °C and a (65 ± 5) % relative humidity.

5.4 Pre-treatment of testing of water vapour resistance (see 6.12) shall be in accordance with EN 31092 on the whole component assembly.

6 Requirements**6.1 Flame spread**

6.1.1 Materials and seams shall be tested according to EN ISO 15025:2002, procedure A, and they shall achieve flame spread index 3 of EN 533:1997. Results are evaluated when the samples are on the test frame.

6.1.1.1 For materials, 3 specimens in machine direction and 3 specimens in cross direction shall be tested according to EN ISO 15025:2002, procedure A, and they shall achieve flame spread index 3 of EN 533:1997.

6.1.1.2 For seams, 3 specimens containing a structural seam shall be tested according to EN ISO 15025:2002, procedure A, and they shall achieve flame spread index 3 of EN 533:1997 and shall not open. Specimens shall be oriented with the seam running up the centre line of the test specimen so that the burner flame impinges directly upon the seam.

6.1.2 No specimen shall give hole formation in any layer except for a layer other than the outer material or innermost lining when tested according to 6.1.1, which is used for specific protection other than heat protection, for example a layer which provides protection against liquid penetration etc.

6.1.3 The component assembly of the outer garment shall be tested according to 6.1.1 by applying the test flame to the surface of the outer material and to the surface of the innermost lining.

6.1.4 If the levels of protection are achieved by multilayer clothing assemblies which are separate garments, the outer surface and innermost lining of each garment used in the assembly shall be tested according to 6.1.1.

6.1.5 If the clothing assembly incorporates wristlet materials these shall be tested separately applying the flame to the outer surface of the wristlet material according to EN ISO 15025:2002, procedure A, and they shall achieve flame spread index 3 of EN 533:1997.

6.1.6 If hardware is used in protective clothing this shall be tested separately applying the flame to the outer surface of the hardware items, according to EN ISO 15025. The hardware shall remain functioning after the test.

6.2 Heat transfer – Flame

The component assembly or multilayer clothing assembly when tested according to EN 367 shall achieve the following performance levels and be classified accordingly:

Table 1 — Heat transfer (flame)

Heat transfer index	Performance	
	level 1	level 2
HTI ₂₄	≥ 9,0	≥ 13,0
HTI ₂₄ – HTI ₁₂	≥ 3,0	≥ 4,0

The number of samples indicated in the standard shall be tested and the performance classified according to the lowest single result, rounded to one decimal place. Where performance levels 1 and 2 exist in the same garment or multilayer clothing assembly, it shall be classified as level 1 (see Clause 7, Marking).

6.3 Heat transfer – Radiation

The component assembly or multilayer clothing assembly when tested according to EN ISO 6942 at a heat flux density of 40 kW/m² shall achieve the following performance levels and be classified accordingly:

Table 2 — Heat transfer (radiation)

Heat transfer factor index	Performance level 1	Performance level 2
RHTI 24	≥ 10,0	≥ 18,0
RHTI 24 - RHTI 12	≥ 3,0	≥ 4,0

The number of samples indicated in the standard shall be tested and the performance classified according to the lowest single result, rounded to one decimal place. Where performance levels 1 and 2 exist in the same garment or multilayer clothing assembly, it shall be classified as level 1 (see Clause 7, Marking).