

SLOVENSKI STANDARD

SIST EN 1486:2007

01-december-2007

Nadomešča:

SIST EN 1486:1996

Varovalna obleka za gasilce - Preskusne metode in zahteve za odsevno obleko za posebne načine gašenja požarov

Protective clothing for fire-fighters - Test methods and requirements for reflective clothing for specialised fire-fighting

Schutzkleidung für die Feuerwehr - Prüfverfahren und Anforderungen für reflektierende Kleidung für die spezielle Brandbekämpfung

Vêtements de protection pour sapeurs-pompiers - Méthodes d'essai et exigences relatives aux vêtements réfléchissants pour opérations spéciales de lutte contre l'incendie

Ta slovenski standard je istoveten z: EN 1486:2007

ICS:

13.220.10	Gašenje požara	Fire-fighting
13.340.10	Varovalna obleka	Protective clothing

SIST EN 1486:2007

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 1486:2007

<https://standards.iteh.ai/catalog/standards/sist/b4d3d576-0c90-4f87-b761-336bbaf3b6f9/sist-en-1486-2007>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1486

October 2007

ICS 13.340.10

English Version

**Protective clothing for fire-fighters - Test methods and
requirements for reflective clothing for specialised fire-fighting**

Vêtements de protection pour sapeurs-pompiers -
Méthodes d'essai et exigences relatives aux vêtements
réfléchissants pour opérations spéciales de lutte contre
l'incendie

Schutzkleidung für die Feuerwehr - Prüfverfahren und
Anforderungen für reflektierende Kleidung für die spezielle
Brandbekämpfung

This European Standard was approved by CEN on 26 August 2007.

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 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 Management Centre has the same status as the official versions.

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

<https://standards.iteh.ai/catalog/standards/sist/b4d3d576-0c90-4f87-b761-336bbaf3b6f9/sist-en-1486-2007>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	8
4 General requirements.....	9
4.1 Clothing ensemble.....	9
4.2 Clothing	10
4.2.1 General.....	10
4.2.2 Pockets	10
4.2.3 Size designation.....	10
4.3 Head protection.....	10
4.3.1 General.....	10
4.3.2 Screen	11
4.4 Hand protection	12
4.5 Overboots	12
5 Sampling, pre-treatment, ageing.....	12
5.1 Sampling.....	12
5.2 Pre-treatment.....	13
5.2.1 General.....	13
5.2.2 Cleaning.....	13
5.2.3 Mechanical pre-treatment	13
5.3 Ageing.....	13
6 Thermal requirements	13
6.1 Limited flame spread.....	13
6.2 Heat transfer (radiant heat).....	13
6.3 Heat transfer (convective heat)	14
6.4 Contact heat	14
6.5 Heat resistance	14
7 Mechanical requirements.....	14
7.1 Dimensional change.....	14
7.2 Tensile strength	14
7.3 Burst strength	14
7.4 Tear strength	15
7.5 Seam strength	15
8 Other requirements.....	15
8.1 Surface wetting	15
8.2 Whole Garment Testing (<i>optional</i>).....	15
9 Marking	15
10 Information supplied by the manufacturer	16
Annex A (normative) Mechanical pre-treatment for metallised materials.....	18
A.1 Principle.....	18
A.2 Sampling.....	18
A.3 Apparatus	18
A.4 Procedure	18

Annex B (informative) Warning – flame engulfment	20
Annex C (informative) Guidelines for clothing design	21
Annex D (informative) Checking of basic ergonomic features of protective clothing – practical performance tests	22
Annex E	24
Annex F (informative) Significant technical changes between this document and the previous edition EN 1486:1996	26
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 89/686/EEC	27
Bibliography	29

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 1486:2007

<https://standards.iteh.ai/catalog/standards/sist/b4d3d576-0c90-4f87-b761-336bbaf3b6f9/sist-en-1486-2007>

Foreword

This document (EN 1486:2007) 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 April 2008, and conflicting national standards shall be withdrawn at the latest by April 2008.

This document supersedes EN 1486:1996.

Annex A provides details of significant technical changes between this European Standard and the previous edition: EN 1498:1996

This document 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 89/686/EEC.

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

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

[SIST EN 1486:2007](https://standards.iteh.ai/catalog/standards/sist/b4d3d576-0c90-4f87-b761-336bbaf3b6f9/sist-en-1486-2007)

<https://standards.iteh.ai/catalog/standards/sist/b4d3d576-0c90-4f87-b761-336bbaf3b6f9/sist-en-1486-2007>

Introduction

This European Standard specifies reflective protective clothing, which provide higher levels of protection against radiant heat than the non-reflective clothing specified in EN 469. This reflective clothing may be used in certain techniques of specialised fire-fighting.

However, protective clothing conforming to EN 469 may also be used with different specialised fire-fighting techniques. The type of protective clothing employed should be appropriate for the fire-fighting tactics.

A risk assessment shall be used to determine if the clothing covered by this European Standard is suitable for the intended use for the expected exposure. The risk assessment should include consideration of any respiratory protection that may also be required.

Fire-fighters shall be trained in the use, care and maintenance of the protective clothing covered by this European Standard, including an understanding of its limitations and of the necessity to remove PPE as soon as possible after an incident.

Subject to risk assessment, the clothing covered by this European Standard may be suitable for use in activities other than those considered by this European Standard. Nothing in this European Standard is intended to restrict any jurisdiction, purchaser or manufacturer from exceeding these minimum requirements.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 1486:2007

<https://standards.iteh.ai/catalog/standards/sist/b4d3d576-0c90-4f87-b761-336bbaf3b6f9/sist-en-1486-2007>

1 Scope

This European Standard considers requirements for the protection of the whole body including head, hands and feet. Clothing for head and feet according to this European Standard, however, may only provide sufficient protection when worn together with such basic PPE specified in the relevant standards as noted in paragraphs 4.2 and 4.4 of this European Standard.

This European Standard specifies test methods and minimum performance requirements for reflective protective clothing used in specialised fire-fighting.

This clothing provides protection against flame lick and intense radiant heat and is worn for short periods only, to enable the fire-fighter to enter specific high-risk fire-fighting and fire rescue situations which also require the use of breathing apparatus.

This European Standard only covers protective clothing that relies upon the ability of the outer material to reflect intense radiant heat. This type of reflective clothing may also be used for industrial applications involving high levels of radiant heat.

The reflective clothing specified in this European Standard is not covered in EN 469.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 136:1998, *Respiratory protective devices — Full face masks — Requirements, testing, marking*

EN 166:2001, *Personal eye-protection — Specifications* [standards/sist/b4d3d576-0c90-4f87-b761-336bbaf3b6f9/sist-en-1486-2007](#)

EN 171:2002, *Personal eye-protection — Infrared filters — Transmittance requirements and recommended use*

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 397, *Industrial safety helmets*EN 420:2003, *Protective gloves — General requirements and test methods*EN 443, *Helmets for firefighters*

EN 702, Protective clothing — Protection against heat and flame — Test method: Determination of the contact heat transmission through protective clothing or its materials

EN 14052, *High performance industrial helmets*EN 15090, *Footwear for firefighters*EN 24920, *Textiles — Determination of resistance to surface wetting (spray test) of fabrics*

EN 25077, *Textiles — Determination of dimensional change in washing and drying (ISO 5077:1984)*

EN ISO 1421:1998, *Rubber- or plastics-coated fabrics — 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 6942, *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, *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 13934-2, *Textiles — Tensile properties of fabrics — Part 2: Determination of maximum force using the grab method (ISO 13934-2:1999)*

EN ISO 13935-2, *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 13935-2:1999)*

EN ISO 13938-1, *Textiles — Bursting properties of fabrics — Part 1: Hydraulic method for determination of bursting strength and bursting distension (ISO 13938-1:1999)*

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

EN ISO 20345, *Personal protective equipment — Safety footwear (ISO 20345:2004)*

ISO 7000, *Graphical symbols for use on equipment — Index and synopsis*

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

SIST EN 1486:2007

<https://standards.iteh.ai/catalog/standards/sist/b4d3d576-0c90-4f87-b761-336bbaf3b6f9/sist-en-1486-2007>

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

ageing

changing of the product performance over time during use or storage. Ageing is caused by a combination of several factors, such as:

- cleaning, maintenance or disinfecting processes;
- exposure to visible and/or ultra-violet radiation;
- exposure to high or low temperatures or to changing temperatures;
- exposure to chemicals including humidity;
- exposure to biological agents such as bacteria, fungi, insects or other pests;
- exposure to mechanical action such as abrasion, flexing, pressure and strain;
- exposure to contaminants such as dirt, oil, splashes of molten metal etc.;
- exposure to wear and tear

ITeH STANDARD PREVIEW
(standards.iteh.ai)

3.2

cleaning

process by which a PPE is made again serviceable and/or hygienically wearable by removing any dirt or contamination. A cleaning cycle is typically a washing plus drying or a dry cleaning treatment followed, if required, by ironing or other finishing

<https://standards.iteh.ai/catalog/standards/sist/b4d3d576-0c90-4f87-b761-336bbaf3b6f9/sist-en-1486-2007>

3.3

closure system

method of fastening openings in the garment including combinations of more than one method of achieving a secure closure, e.g. a slide fastener covered by an overlap fastened down with a touch and close fastener

NOTE This term does not cover seams.

3.4

clothing assembly

series of outer and under garments to be worn together

3.5

clothing ensemble

combination of two or more garments that collectively provide protection of the body

3.6

component assembly

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

3.7

conditioning

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

3.8**garment**

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

3.9**hardware**

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

3.10**hood**

separate garment or integrated part of the jacket or coverall that covers head, neck and shoulders

3.11**main seams**

seams that are necessary for the integrity of the garment

3.12**pre-treatment**

standard way of preparing the samples before testing. This might include e.g. a number of cleaning cycles, submitting the sample to heat, mechanical action or any other relevant exposure and is finished by conditioning

3.13**screen**

transparent visor integrally fitted to the hood of reflective protective clothing

3.14**seam**

method of permanent fastening between two or more pieces of material

3.15**specialised fire-fighting**

limited fire-fighting operations involving very high levels of radiant, convective and contact heat, such as bulk flammable gas and bulk flammable liquid fires

4 General requirements**4.1 Clothing ensemble**

Fire fighters' protective clothing covered by this European Standard shall provide protection against intense radiant heat and flame lick to the full body, including the head, hands, and feet, as specified in Clauses 4 to 8.

It shall consist of:

- garment(s);
- hood (may be integrated or not);
- gloves;
- overboots.

The materials shall not contain substances generally known to be toxic, carcinogenic, mutagenic, allergenic, toxic to reproduction or otherwise harmful.

EN 1486:2007 (E)

Hardware, except the screen, penetrating the outer material shall not be exposed on the innermost surface of the component assembly. This requirement shall be assessed by visual inspection.

All items shall be free from any sharp or hard edges that are likely to cause harm to the user, e.g. protruding wire ends or other items. This requirement shall be assessed by visual inspection and by hand.

All items shall have an overlap so no part of the body becomes uncovered 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.

All items shall remain in place 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.

Since this type of clothing is designed to be used with respiratory protection, it shall be considered that the breathing apparatus may be worn either inside or outside of the protective clothing. Compatibility shall be assessed while the clothing is worn by an appropriate sized wearer.

4.2 Clothing**4.2.1 General**

Fire fighters' protective clothing covered by this European Standard shall consist of either:

- a) a single garment, or
- b) a clothing ensemble, or
- c) a clothing assembly.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 1486:2007

Where clothing assemblies or ensembles are used to achieve the specified performance levels of this European Standard, the various garments shall be clearly labelled that they shall always be used in combination (see Clause 9).

The hood can be an integral part of the jacket or coverall.

4.2.2 Pockets

If external pockets are present they shall be constructed entirely from the outer material, and secured by flaps which shall be at least 2,5 cm on each side wider than the pocket. Pockets shall have means for drainage of water.

4.2.3 Size designation

The sizes of the clothing shall be designated in accordance with EN 340 and verified by visual inspection.

The fit of the size shall be assessed while the clothing is worn by an appropriately sized wearer.

4.3 Head protection**4.3.1 General**

The hood shall meet the requirements of Clauses 6, 7 and 8. Screens used with hoods shall meet the requirements of 4.3.2 and 6.5.