

KAITSERIIETUS. KUUMUSE JA LEEKIDE EEST KAITSET  
PAKKUV RIIETUS. MINIMAALSED TOIMIVUSNÕUDED

Protective clothing - Clothing to protect against heat  
and flame - Minimum performance requirements (ISO  
11612:2015)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 11612:2015 sisaldab Euroopa standardi EN ISO 11612:2015 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 11612:2015 consists of the English text of the European standard EN ISO 11612:2015.
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English Version

**Protective clothing - Clothing to protect against heat and flame -  
Minimum performance requirements (ISO 11612:2015)**

Vêtements de protection - Vêtements de protection contre  
la chaleur et les flammes - Exigences de performance  
minimales (ISO 11612:2015)

Schutzkleidung - Kleidung zum Schutz gegen Hitze und  
Flammen (ISO 11612:2015)

This European Standard was approved by CEN on 14 May 2015.

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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## European foreword

This document (EN ISO 11612:2015) 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, in collaboration with Technical Committee ISO/TC 94 "Personal safety -- Protective clothing and equipment".

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of an identical text or by endorsement, at the latest by January 2016, and conflicting national standards shall be withdrawn at the latest by January 2016.

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

This document supersedes EN ISO 11612:2008.

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(s).

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### Endorsement notice

The text of ISO 11612:2015 has been approved by CEN as EN ISO 11612:2015 without any modification.

## Annex ZA (informative)

### Relationship between this European Standard and the Essential Requirements of EU Directive 89/686/EEC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide one means of conforming to Essential Requirements of the New Approach Directive 89/686/EEC on the approximation of the laws of the Member States relating to personal protective equipment.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this International Standard given in Table ZA.1 confers, within the limits of the scope of this International Standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

**Table ZA.1 — Correspondence between this International Standard and Directive 89/686/EEC**

Clause(s)/sub-clause(s) of this International Standard	Essential requirements (ERs) of EU Directive 89/686/EEC, Annex II	Qualifying remarks/Notes
4.2.2., 4.2.3., 4.3, 4.4, 4.5, 6.2, 6.4, and 6.6	1.2.1 Absence of risks and other 'inherent' nuisance factors.	
4.2.2.	1.3.1 Adaptation of PPE to user morphology.	
5.2, Clause 8, Clause 9	1.4 Information supplied by manufacturer.	
5.3.	2.4 PPE subject to ageing	
5.2.1, 6.3, 7.2, 7.3, 7.4, 7.5, and 7.6	3.6.1 Protection against heat and/or fire. PPE constituent materials and other components.	
7.2, 7.3, 7.4, 7.5, and 7.6	3.6.2 Protection against heat and/or fire. Complete PPE ready for use.	
6.5	1.3.2 Lightness and design strength.	
Clause 8	2.12 PPE bearing one or more identification or recognition marks directly or indirectly relating to health and safety.	

**WARNING:** Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

# Contents

Page

<b>Foreword</b> .....	<b>v</b>
<b>Introduction</b> .....	<b>vii</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
<b>4 General and design requirements</b> .....	<b>4</b>
4.1 General.....	4
4.2 Size designation and fit.....	5
4.2.1 General.....	5
4.2.2 Protective clothing.....	5
4.2.3 Additional protective garments.....	5
4.3 Pockets and closures.....	5
4.4 Hardware.....	5
4.5 Additional design requirements for molten splash protective garments.....	6
<b>5 Sampling and pre-treatment</b> .....	<b>6</b>
5.1 Sampling.....	6
5.2 Pre-treatment.....	6
5.2.1 Pre-treatment by cleaning.....	6
5.2.2 Mechanical pre-treatment.....	7
5.3 Ageing.....	7
5.4 Conditioning.....	7
<b>6 General performance requirements</b> .....	<b>7</b>
6.1 General.....	7
6.2 Heat resistance.....	7
6.2.1 Heat resistance at a temperature of $(180 \pm 5) ^\circ\text{C}$ .....	7
6.2.2 Optional requirement — Heat resistance at a temperature of $(260 \pm 5) ^\circ\text{C}$ .....	8
6.3 Limited flame spread.....	8
6.3.1 General.....	8
6.3.2 Testing in accordance with ISO 15025, Procedure A (code letter A1).....	8
6.3.3 Testing in accordance with ISO 15025, Procedure B (code letter A2).....	9
6.4 Dimensional change of textile materials.....	10
6.5 Physical requirements.....	10
6.5.1 Tensile strength.....	10
6.5.2 Tear strength.....	10
6.5.3 Burst strength for knitted materials and seams.....	10
6.5.4 Seam strength.....	10
6.6 Fat content of leather.....	10
<b>7 Heat transmission performance requirements</b> .....	<b>11</b>
7.1 General.....	11
7.2 Convective heat (code letter B).....	11
7.3 Radiant heat (code letter C).....	11
7.4 Molten aluminium splash (code letter D).....	11
7.5 Molten iron splash (code letter E).....	12
7.6 Contact heat (code letter F).....	12
<b>8 Summary of flame and heat transmission tests and corresponding letter codes (see Table 8)</b> .....	<b>13</b>
<b>9 Optional test — Whole garment test against fire exposure on thermal manikin</b> .....	<b>13</b>
<b>10 Marking</b> .....	<b>13</b>
<b>11 Information supplied by the manufacturer</b> .....	<b>14</b>

<b>Annex A</b> (normative) <b>Mechanical pre-treatment for metallized materials</b> .....	<b>15</b>
<b>Annex B</b> (normative) <b>Determination of property values for rating and classification</b> .....	<b>17</b>
<b>Annex C</b> (informative) <b>Guidelines for clothing design</b> .....	<b>18</b>
<b>Annex D</b> (informative) <b>Risk assessment</b> .....	<b>19</b>
<b>Annex E</b> (normative) <b>Uncertainty of measurement</b> .....	<b>20</b>
<b>Bibliography</b> .....	<b>21</b>

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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](http://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](http://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;

- 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](#).

## 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*.

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

## 1 Scope

This International Standard specifies performance requirements for protective clothing made from flexible materials, which are designed to protect the wearer's body, except the hands, from heat and/or flame. For protection of the wearer's head and feet, the only items of protective clothing falling within the scope of this International Standard are gaiters, hoods, and overboots. However, concerning hoods, requirements for visors and respiratory equipment are not given.

The performance requirements set out in this International Standard are applicable to protective clothing which could be worn for a wide range of end uses, where there is a need for clothing with limited flame spread properties and where the user can be exposed to radiant or convective or contact heat or to molten metal splashes.

This International Standard is not applicable to protective clothing that is specified by other International Standards (see Introduction).

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3376:2011, *Leather — Physical and mechanical tests — Determination of tensile strength and percentage extension*

ISO 3377-1, *Leather — Physical and mechanical tests — Determination of tear load — Part 1: Single edge tear*

ISO 4048, *Leather — Chemical tests — Determination of matter soluble in dichloromethane and free fatty acid content*

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

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 9151, *Protective clothing against heat and flame — Determination of heat transmission on exposure to flame*

ISO 9185, *Protective clothing — Assessment of resistance of materials to molten metal splash*

ISO 12127-1, *Clothing for protection against heat and flame — Determination of contact heat transmission through protective clothing or constituent materials — Part 1: Test method using contact heat produced by heating cylinder*

ISO 13506, *Protective clothing against heat and flame — Test method for complete garments — Prediction of burn injury using an instrumented manikin*

ISO 13688, *Protective clothing — General requirements*

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

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 13937-2, *Textiles — Tear properties of fabrics — Part 2: Determination of tear force of trouser-shaped test specimens (Single tear method)*

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

ISO 13938-2, *Textiles — Bursting properties of fabrics — Part 2: Pneumatic method for determination of bursting strength and bursting distension*

ISO 15025, *Protective clothing — Protection against heat and flame — Method of test for limited flame spread*

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

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TR 11610 and the following apply.

#### 3.1 ageing

changing of the product performance over time during use or storage

Note 1 to entry: Ageing is caused by a combination of several factors, such as:

- cleaning, maintenance, or disinfecting processes;
- exposure to visible and/or ultraviolet 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.

#### 3.2 cleaning

process by which a PPE is made again serviceable and/or hygienically wearable by removing any dirt or contamination

Note 1 to entry: A cleaning cycle is typically a washing plus drying or a dry cleaning treatment followed, if required, by ironing or finishing.

#### 3.3 clothing assembly

series of garments arranged in the order as worn

Note 1 to entry: They may contain multilayer materials, material combinations, or a series of separate garments in single layers.

#### 3.4 component

any material, part, or sub-assembly used in the construction of an item of PPE