

# **SLOVENSKI STANDARD**

## **SIST-TP CEN/TR 14560:2019**

**01-januar-2019**

**Nadomešča:**  
**SIST-TP CEN/TR 14560:2003**

---

**Navodilo za izbor, uporabo, nego in vzdrževanje varovalne obleke pred učinki toplote in ognja**

Guidance for selection, use, care and maintenance of protective clothing against heat and flame

Leitfaden für Auswahl, Gebrauch, Pflege und Instandhaltung von Schutzkleidung gegen Hitze und Flammen

Guide pour la sélection, l'utilisation, l'entretien et la maintenance des vêtements de protection contre la chaleur et la flamme

**Ta slovenski standard je istoveten z: CEN/TR 14560:2018**

---

**ICS:**

13.340.10	Varovalna obleka	Protective clothing
-----------	------------------	---------------------

**SIST-TP CEN/TR 14560:2019** **en**

## **iTeh STANDARD PREVIEW** **(standards.iteh.ai)**

[SIST-TP CEN/TR 14560:2019](https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-2d9ef3ecf7d1/sist-tp-cen-tr-14560-2019)

<https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-2d9ef3ecf7d1/sist-tp-cen-tr-14560-2019>

TECHNICAL REPORT

CEN/TR 14560

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

November 2018

ICS 13.340.10

Supersedes CEN/TR 14560:2003

English Version

## Guidance for selection, use, care and maintenance of protective clothing against heat and flame

Guide pour la sélection, l'utilisation, l'entretien et la  
maintenance des vêtements de protection contre la  
chaleur et la flamme

Leitfaden für Auswahl, Gebrauch, Pflege und  
Instandhaltung von Schutzkleidung gegen Hitze und  
Flammen

This Technical Report was approved by CEN on 5 October 2018. It has been drawn up by the Technical Committee CEN/TC 162.

CEN members are the national standards bodies of 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST-TP CEN/TR 14560:2019](https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-2d9e3ecf7d1/sist-tp-cen-tr-14560-2019)

<https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-2d9e3ecf7d1/sist-tp-cen-tr-14560-2019>



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

<b>Contents</b>	<b>Page</b>
European foreword.....	4
Introduction .....	5
1 Scope .....	7
2 Total process.....	7
2.1 Introduction flow charts.....	7
2.2 Flow chart diagram.....	8
3 Terms and definitions .....	8
4 Selection .....	13
4.1 General.....	13
4.2 Risk assessment.....	14
4.3 Defining the level of protection required for each activity from the protective clothing .....	14
4.4 Optimal protective clothing .....	15
4.5 Request for information .....	16
4.6 Wearer trials.....	17
4.7 Additional testing to assist selection process .....	18
4.8 Other considerations .....	19
4.9 Compatibility .....	20
4.9.1 General.....	20
4.9.2 Physical compatibility .....	21
4.9.3 Thermal compatibility .....	21
5 Use .....	21
5.1 General.....	21
5.2 Training .....	22
5.3 Introducing protective clothing into service .....	22
5.4 Record keeping .....	22
5.5 Routine examination .....	23
5.6 In service evaluation and monitoring.....	24
5.7 Frequency of cleaning on type of Protective Clothing .....	24
6 Care .....	24
6.1 General.....	24
6.2 Cleaning .....	26
6.3 Drying.....	28
6.4 Decontamination.....	28
6.5 Label, marking and instruction for use/manufacturer's instructions/user instructions .....	28
6.6 Storage .....	29
7 Maintenance.....	29
7.1 General.....	29
7.2 Inspection .....	31
7.2.1 General.....	31
7.2.2 Inspection schedule by the user .....	31
7.2.3 Elements to be inspected.....	32
7.2.4 Decisions .....	33

7.3	Repairs and alterations .....	33
7.4	Disposal .....	33
Annex A (informative) Performance levels relating to clothing designed to provide protection from heat and flame.....		35
A.1	General .....	35
A.2	Standards describing performance requirements for protective clothing or materials .....	37
Annex B (informative) Risk assessment.....		48
Annex C (informative) Examples: Relationship between type of activity, the heat/flame hazard linked to the activity and clothing to be chosen for protection based on the existing product standards .....		51
Annex D (informative) Flow chart selection use care and maintenance of protective clothing against heat and flame risks.....		54
Annex E (informative) Practical performance tests.....		55
E.1	Ergonomics .....	55
E.2	Cold protection .....	59
E.3	Rain protection.....	59
E.4	Parameters to be measured.....	60
E.5	Additional testing .....	60
E.6	Heat protection.....	60
E.7	Physiological heat load.....	61
Annex F (informative) Description of burn injury risks.....		62
Annex G (informative) Label, marking and instruction for use/manufacturer's instructions/user instructions (for procurement) .....		64
Bibliography .....		68

**CEN/TR 14560:2018 (E)****European foreword**

This document (CEN/TR 14560:2018) 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.

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 will supersede CEN/TR 14560:2003.

**iTeh STANDARD PREVIEW  
(standards.iteh.ai)**

SIST-TP CEN/TR 14560:2019

<https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-2d9ef3ecf7d1/sist-tp-cen-tr-14560-2019>

## Introduction

For manufacturers and users of personal protective equipment the following European Regulation and Directive are important:

- Regulation (EU) 2016/425 of the European Council of 9<sup>th</sup> March 2016 on personal protective equipment (replacing the Directive 89/686 EEC);
- Directive 89/656/EEC on use of personal protective equipment.

Regulation (EU) 2016/425 indicates that in order to place PPE on the market it shall meet essential health and safety requirements, and not necessarily the various relevant EN or EN ISO standards. Nevertheless nearly all PPE meet the essential requirements through standards, as harmonised standards give presumption of conformity with the requirements of the directive. This is the reason we will spend sometimes explaining certain standard and what information they provide on the heat and flame protective clothing. Requirements and test methods should be, as far as possible, representative of the risks against those that it is necessary to protect the user under the foreseeable conditions of use.

The reader will want to be aware that where PPE is intended for use in a place of work, national and Union legislation intended to ensure the safety of employees will usually apply. When one mentions PPE, it is essential that it meets the requirements of Regulation (EU) 2016/425. Directive 89/656/EEC (Use Directive) provides that the employer who fails to provide suitable PPE commits a criminal offence and an employee who suffers foreseeable injury can trigger liability. Conversely, if the employee, after proper training and instructions, fails to wear the suitable PPE; the employee can also be prosecuted and/or dismissed and if injured or suffers disease in consequence will probably lose right to all or certain part of the damages.

The information in this technical report has been produced to assist users, employers and purchasers (or the person who advises the employer) in making the necessary decisions regarding the selection, use, care and maintenance of protective clothing, for employees exposed to risks related to heat and flame (e.g. industrial welding, fire-fighting, first response).

The purpose of this technical report is to establish a guidance document for protective clothing against heat and flames with the goal to evaluate and reduce the safety risks and potential health risks associated with poorly maintained, contaminated, deterioration, or damaged protective clothing. This selection use, care and maintenance guidance provides basic answers, criteria, and options for the persons that are selecting or using protective clothing through its life cycle with respect to protection it provides guidance related to heat and flame or damaged protective clothing.

The main topics that an employer needs to consider are highlighted in this technical report. Many paragraphs of the document contain bullet-lists as thought provokers and options that may need to be considered. A number of flowcharts have been created to help understand the flow of this document and can be used as a process in the life cycle of heat and flame protective clothing from selection to disposal. These flowchart(s) may need to be reiterated a number of times to come to the optimum solution or to ensure continued adequate protection. The annexes are additional detail that would make the main body too complicated to read, but are necessary to describe hazards and risks, the value of the test methods for the end user, etc.

Normative references are not provided in this report. All references are of an informative nature only.

Annex A gives details of the current European Standards relating to clothing designed to provide protection from heat and flame.

Please be aware and consider compatibility with other items of PPE, that both protect against heat and flame, but there should also be considering other risks.

**CEN/TR 14560:2018 (E)**

Selection of protective clothing for heat flames should be based on your own risk assessment and should not be copied from other procurement documents.

For European legislation on PPE see Regulation (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment and European Directive 89/656/EEC on use of personal protective equipment.

## **iTeh STANDARD PREVIEW (standards.iteh.ai)**

SIST-TP CEN/TR 14560:2019

<https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-2d9ef3ecf7d1/sist-tp-cen-tr-14560-2019>



## 1 Scope

This document provides guidance to the employers, users and purchasers with respect to selection, use, care, and maintenance requirements for protective clothing against heat and flame and is compliant with the European legislation.

This document is not exhaustive in addressing all the safety concerns associated with the use of compliant protective equipment for protection against heat and flames and other related risks.

It is essential not to construe this document as addressing all the safety concerns, if any, associated with the use of this document by testing or repair facilities. It is the responsibility of the persons and organizations that use this document and any other standards related technical report to PPE:

- to conduct a risk assessment,
- to select the protective clothing and other PPE,
- as well as to ensure that these provide a holistic protection, only when the compatibility has been assessed including understanding the work place and the work environment to determine the properties of protective clothing against heat and flames to establish safety and health practices
- and to determine the applicability of regulatory limitations prior to using this technical report for any designing, manufacturing, and testing.

This guidance is meant for all end users that may be confronted with heat and flame risks although it will focus on the first four in the list below:

- petrochemical and chemical industry;
- welders and foundries;
- utilities (electrical, gas, water);
- fire fighters and emergency response;
- sports (motor sports, boating, etc.);
- security forces (military, police and private).

It is essential that nothing herein restricts any jurisdiction from exceeding the minimum requirements as provided in the relevant standards.

## 2 Total process

### 2.1 Introduction flow charts

The flowchart diagram below shows the complete SUCAM process. The process will be described in detail in the following clauses. All clauses correspond with the coloured blocks in the below diagram. Clause 3 describes the used terms and definitions. Clause 4 describes the selection process of the flame retardant (FR) clothing. Clause 5 describes the use of the FR clothing. Clause 6 describes the care process of FR clothing. Finally Clause 7 describes maintenance of FR clothing.

## 2.2 Flow chart diagram

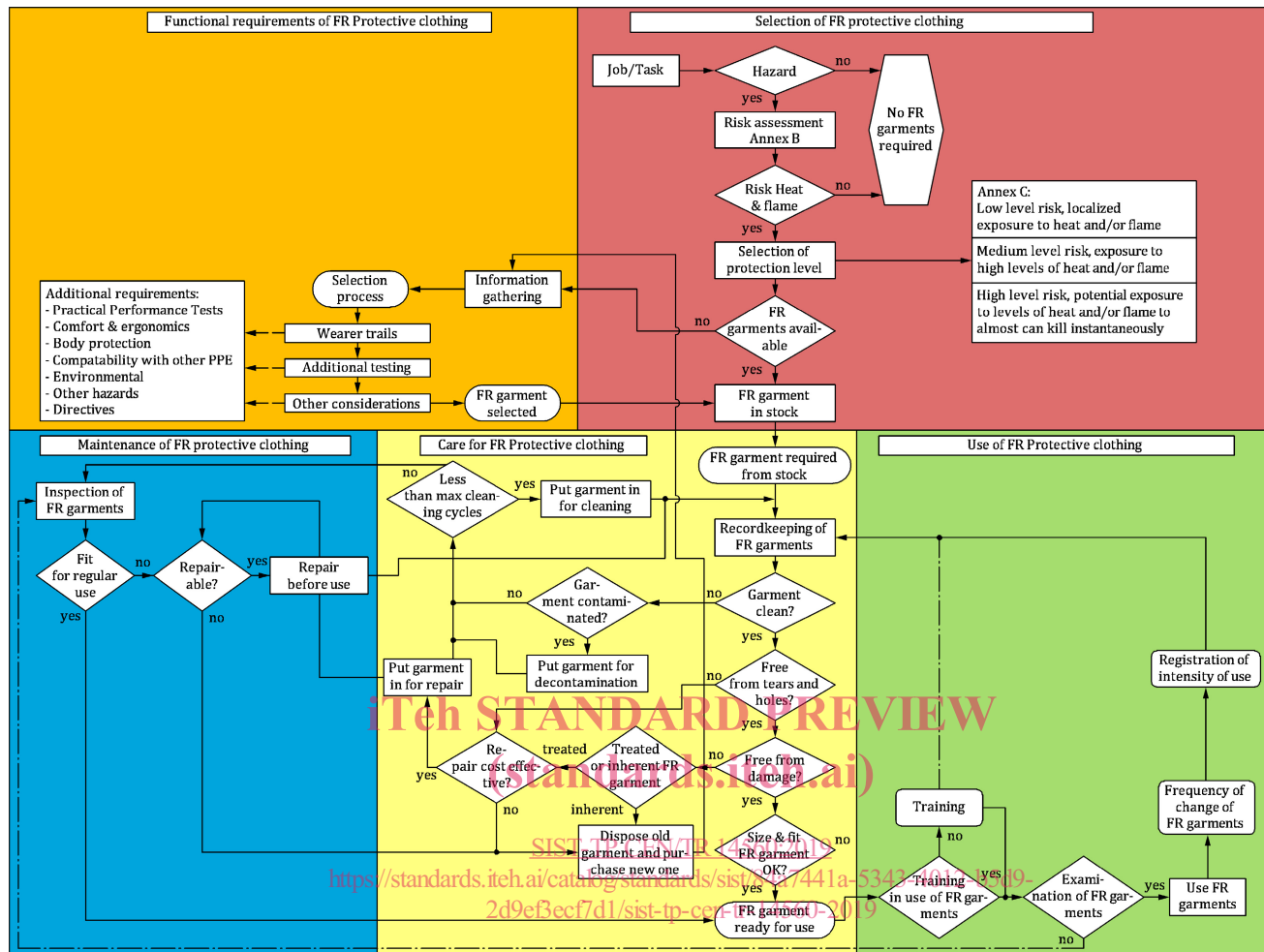


Figure 1

## 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 <http://www.iso.org/obp>

### 3.1

#### ageing

change of one or more initial properties of the materials during the passage of time

### 3.2

#### component assembly

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

**3.3****care**

to keep protective clothing in good condition, including procedures for cleaning, decontamination, storage and registration

**3.4****char**

formation of a brittle residue when material is exposed to thermal energy

**3.5****cleaning**

act of removing soils and contaminants from ensembles and ensemble elements by mechanical, chemical, thermal, or combined processes

**3.6****coat**

element of the protective ensemble that provides protection to the upper torso and arms, excluding the hands and head

**3.7****compatibility**

ability of clothing (protective clothing and other clothing) to be used in conjunction with other parts of PPE

**iTeh STANDARD PREVIEW**

**3.8****contamination/contaminated (standards.iteh.ai)**

process by which ensembles and ensemble elements are exposed to hazardous materials, body fluids, or CBRN (chemical, biological, radiological, nuclear) agents

<https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-2d9e3ecf7d1/sist-tp-cen-tr-14560-2019>

**3.9****coverall**

element of the protective ensemble that provides protection to the torso, arms, and legs, excluding the head, hands, and feet

**3.10****cross-contamination**

transfer of contamination from one item to another or to the environment

**3.11****decontamination**

act of removing contaminants from protective clothing and equipment by a physical, chemical, or combined process

Note 1 to entry: See also 3.5 cleaning.

**3.12****deterioration**

downgrading of the effectiveness or physical characteristics of textile materials due to use, care, maintenance or storage conditions

**3.13****disinfectant**

agent that destroys, neutralizes, or inhibits the growth of harmful biological agents

**CEN/TR 14560:2018 (E)****3.14****ensemble**

combination or assembly of multiple items that are individually compliant and provide protection to the head, upper torso together with arms and hands, the lower torso together with feet, and respiratory protection, and that together fulfil all the requirements

**3.15****ergonomics**

scientific discipline concerned with the understanding of the interactions among human and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance

**3.16****field evaluation**

non-laboratory assessment of an ensemble, ensemble element, or item

**3.17****fit**

quality, state, and manner in which clothing, when worn, relate to the individual human body or other PPE

**3.18****flame resistance**

<protective clothing and equipment> property of a material whereby combustion is prevented, terminated, or inhibited following the application of a flaming or non-flaming source of ignition, with or without subsequent removal of the ignition source

**3.19****functional**

ability of an ensemble element or component of an ensemble element to continue to be utilized for its intended purpose

**3.20****garment**

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

**3.21****hardware**

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

Note 1 to entry: Examples for hardware are fasteners, rank markings, buttons.

**3.22****hazard**

situation which can be the cause of harm or damage to the health of the human body

**3.23****hazardous substance**

substance (solid, liquid, or gas) that when released is capable of creating harm to people, the environment, and property

**3.24****hygiene**

any practice or activity that you do to keep protective clothing healthy and clean

**3.25****inherent flame resistance**

flame resistance that is derived from the essential characteristics of the fibre or polymer

**3.26****integrity**

construction of the protective clothing that guarantees the proper functioning of the protective clothing

Note 1 to entry: Seams, zippers and other closures should provide solid barriers to provide suitable protection as well as be constructed in a manner which provides some flexibility.

**3.27****levels of care and maintenance**

four levels of care and maintenance are recognized, level one is inspection by the user before use, level two is care after use, level three is regular periodically maintenance by trained personnel and level four is professional maintenance by specialists

**3.28****liner**

optional component layer that provides added protection, e.g. against rain or chemicals and/or against cold

**3.29****maintenance**

to preserve from loss or deterioration to include procedures for inspection, repair and ultimate removal from service

**3.30****protective clothing**

clothing which covers or replaces personal clothing and which is designed to provide protection against one or more hazards

**3.31****rapid deterioration**

unexpected loss of the essential requirements listed in the PPE regulation

**3.32****risk**

probability of a specific undesired event occurring so that a hazard is realized

**3.33****risk assessment**

overall process that identifies hazards, estimates the potential severity of injury or damage to health, estimates the likelihood of occurrence of injury or danger to health determines the protective clothing against heat and flame risks and other protection measures required

**3.34****selection**

process of determining the type of protective equipment (garments) that is necessary for the required protection

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

[SIST-TP CEN/TR 14560:2019](https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-)

<https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9->

[standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-](https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-)

## CEN/TR 14560:2018 (E)

## 3.35

**tensile strength**

force at which a fibre or fabric will break when pulled in one dimension either in cross direction or in machine direction

## 3.36

**textile fabric**

planar structure consisting of yarns or fibres

## 3.37

**thermal barrier**

component of an ensemble element or item that principally provides thermal protection

## 3.38

**toxic industrial chemical**

toxic solid, liquid, or gaseous chemical from an industrial origin that has been identified as mass casualty threats that could be used to inflict casualties, generally on a civilian population, e.g. during a terrorist attack

## 3.39

**trouser**

element of the protective ensemble that provides protection to the lower torso and legs, excluding the ankles and feet

## 3.40

**universal precautions**

approach to infection control in which human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other blood borne pathogens

## 3.41

**use**

application of protective clothing including its limitations

## 3.42

**verified independent service provider****verified ISP**

independent service provider verified by a third-party certification organization to conduct any one or a combination of advanced inspection, advanced cleaning, basic repair, or advanced repair service

## 3.43

**visibility**

retro-reflective and fluorescent conspicuity enhancements

Note 1 to entry: Retro-reflective enhancements improve night-time conspicuity, and fluorescent enhancements improvement daytime conspicuity.

## 3.44

**wristlet**

interface component of the protective element or item that provides limited protection to the coat/glove interface area

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/84a7441a-5343-4012-b5d9-2d9e3ecf7d1/sist-tp-cen-tr-14560-2019>

## 4 Selection

### 4.1 General

The employer shall develop and implement a program for the selection, use, care, and maintenance of protective clothing against heat and flames used by the employees. Subject to requirements, the process of selecting protective clothing can be divided into a number of steps described in the flowchart below. This program shall have the goal of providing protective clothing against heat and flame and related risks that are suitable and appropriate for the intended use (Job/Task) and fulfil the requirements of the European legislation.

Selection is the starting point when determining the need for protective clothing. The selection should not be limited to their section as a decision may be broader based on use, cleaning, maintenance, etc.

It is the obligation of the manufacturer to give clear instructions about use, care and maintenance of the clothing which has to be followed up by the employee and employer. These instructions shall specify the clean and drying methods and means.

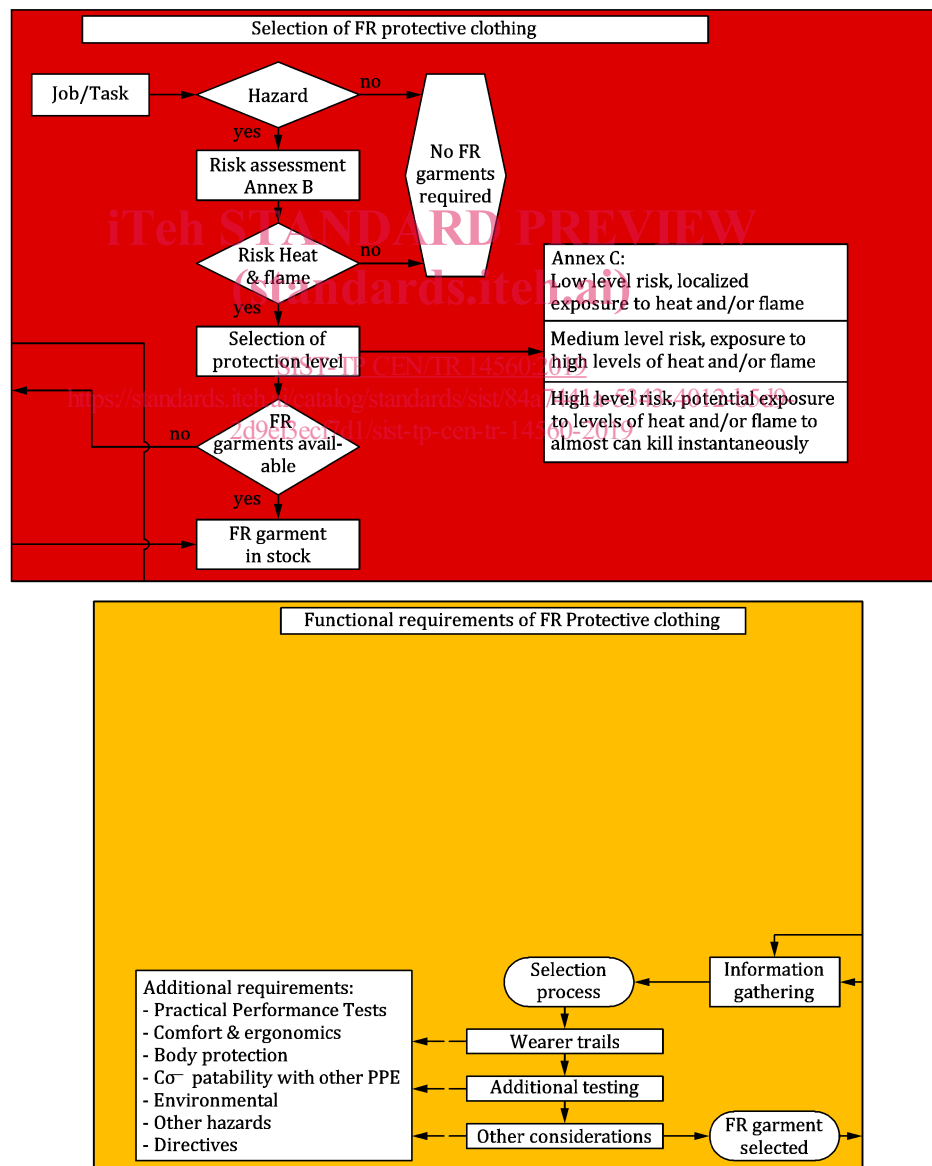


Figure 2