



SLOVENSKI STANDARD
SIST EN 531:1996

01-december-1996

NUy]fbUcV`Y_UnUXY`Uj W`j]bXi glf]`ž_]gc`]ndcghUj`^yb]i]b_ca`'tcd`ch`fbY
j_`f i`^cV`Y_Y`nU[Ug]`W`]b`j Uf]`WŁ

Protective clothing for industrial workers exposed to heat (excluding firefighters' and welders' clothing)

Schutzkleidung für hitzeexponierte Industriearbeiter (ausschließlich Feuerwehr- und Schweißerkleidung)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Vetements de protection pour les travailleurs de l'industrie exposés a la chaleur (excepté les vêtements de sapeurs pompiers et de soudeurs)

<https://standards.iteh.ai/catalog/standards/sist/6a3da055-e979-4b17-8edf-0e95de5d16f3/sist-en-531-1996>

Ta slovenski standard je istoveten z: EN 531:1995

ICS:

13.340.10 Varovalna obleka Protective clothing

SIST EN 531:1996 **en**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 531:1996

<https://standards.iteh.ai/catalog/standards/sist/6a3da055-e979-4b17-8edf-0e95de5d16f3/sist-en-531-1996>

ICS 13.340.10

Descriptors: Personal protective equipment, protective clothing, heat protection, work clothing, specifications, tests, instructions, marking

English version

**Protective clothing for industrial workers exposed
to heat (excluding firefighters' and welders'
clothing)**

Vêtements de protection pour les travailleurs
de l'industrie exposés à la chaleur (excepté
les vêtements de sapeurs pompiers et de
soudeurs)

Schutzkleidung für hitzeexponierte
Industriearbeiter (ausschließlich Feuerwehr-
und Schweißkleidung)

This European Standard was approved by CEN on 1995-02-10. 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.

The European Standards exist 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.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

<https://standards.iteh.ai/catalog/standards/sist/6a3da055-e979-4b17-8edf-0e95de5d16f3/sist/en-531-1995>

0e95de5d16f3/sist/en-531-1995

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

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

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 August 1995, and conflicting national standards shall be withdrawn at the latest by August 1995.

The annex A is normative and contains the mechanical pretreatment for metallised materials.

The annex B is informative and contains the relationship between this European Standard and the EC-Directive for PPE.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 531:1996

<https://standards.iteh.ai/catalog/standards/sist/6a3da055-e979-4b17-8edf-0e95de5d16f3/sist-en-531-1996>

1 Scope

This European standard is applicable to protective clothing for industrial workers exposed to heat, (excluding firefighters' and welders' clothing). The clothing consists of outer garments made from flexible material to protect specific parts of the body. Hoods and gaiters are included but all other types of protection for the head, hands and feet are excluded.

This European standard specifies the performance requirements and methods of test for the protective clothing materials and gives design recommendations for the clothing where necessary.

Protective clothing complying with this European standard is intended to protect industrial workers against brief contact with flame and against at least one type of heat. The heat may be in the form of convective heat, radiant heat, large molten metal splashes, or a combination of these heat hazards.

2 Normative references

This European standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 340	Protective clothing - General requirements
EN 366	Protective clothing- Protection against heat and fire - Method of test: Evaluation of materials and material assemblies when exposed to a source of radiant heat
EN 367	Protective Clothing - Protection against heat and flame- Method of determining heat transmission on exposure to flame
EN 373	Protective clothing- Assessment of resistance of materials to molten metal splash
EN 532	Protective clothing - Protection against heat and flame- Method of test for limited flame spread
ISO 3175	Textiles - Determination of dimensional change on dry cleaning in perchlorethylene
ISO 6330	Textiles - Domestic washing and drying procedures for textile testing

<https://standards.iteh.ai/catalog/standards/sist/6a3da055-e979-4b17-8edf-0e95de5d16f3/sist-en-531-1996>

3 Sampling

Samples for testing shall be representative of the material and/or materials as used in the complete garments. Samples may also be cut from garments. They may include features of construction such as seams, joints, or fasteners if covered by specific requirements.

4 Testing

All tests shall be carried out on material as received, unless otherwise specified (see 6.2.1).

5 General requirements

5.1 Sizes

The size of protective clothing shall be designated according to EN 340.

5.2 Dimensional change

When tested in accordance with EN 340 the change in dimension of the material shall not exceed 3% in either length or width direction after a pretreatment with 5 cycles according to the manufacturers' instructions. If washing as well as dry cleaning is permitted, then only 5 washing cycles will be carried out .

6 Performance requirements

6.1 General

Protective clothing which is claimed to comply with this European standard shall meet the limited flame spread requirement (Code letter A) and at least one other heat transmission performance requirement (Code letters B to E) at level 1 or above.

6.2 Limited flame spread (Code letter A)

6.2.1 Pretreatment

Before testing for limited flame spread the test materials shall be washed five times in a front loading washing machine using 1g/l IEC detergent in soft water and finally dried once in accordance with the procedures of ISO 6330. Washing shall be carried out by procedure 2A (at 60 °C) and drying by procedure E (tumble drying) unless otherwise specified in the care labelling.

Materials which are labelled as dry cleanable only shall be dry cleaned five times in accordance with ISO 3175. If the material or garment has no care label, separate samples shall be tested after five cycles of washing and five cycles of dry cleaning.

6.2.2 Testing and performance requirements

When tested in accordance with EN 532 after the pretreatment specified in 6.2.1, all outer materials or clothing assemblies shall meet the following requirements:

No specimen shall give flaming to the top or either side edge.

No specimen shall give hole formation.

No specimen shall give flaming or molten debris.

The mean value of afterflame time shall be $\leq 2s$.

The mean value of afterglow time shall be $\leq 2s$.

6.3 Convective heat (Code letter B)

When tested in accordance with EN 367 all clothing assemblies which are claimed to offer protection against convective heat shall meet at least level B1 in table 1. The level of performance shall be indicated by the band number (B1 to B5) given in table 1.

Table 1: Performance levels - Convective-heat

Performance levels	Range of HTI values	
	min.	max.
B1	3	6
B2	7	12
B3	13	20
B4	21	30
B5	31	

6.4 Radiant heat (Code letter C)

When tested in accordance with EN 366 Method B at a heat flux density of 20 kW/m² all clothing assemblies which are claimed to offer protection against radiant heat shall meet at least level C1 in table 2. Tests on metallised materials shall be carried out after pretreatment as specified in annex A of this standard. The level of performance shall be indicated by the band number (C1 to C4) given in table 2 .

Table 2: Performance levels - Radiant heat test

performance levels	Mean time to level t ₂ , s	
	min.	max.
C1	8	30
C2	31	90
C3	91	150
C4	151	

6.5 Molten aluminium splash (Code letter D)

When tested in accordance with EN 373 using molten aluminium all clothing assemblies which are claimed to offer protection against molten aluminium splash shall meet at least level D1 in table 3. The level of performance shall be indicated by the band number (D1 to D3) given in table 3.

Table 3: Performance levels - Molten aluminium splash

performance levels	Molten aluminium splash index, g	
	min.	max.
D1	100	200
D2	201	350
D3	351	

6.6 Molten iron splash (Code letter E)

When tested in accordance with EN 373 using molten iron all clothing assemblies which are claimed to offer protection against molten iron splash shall meet at least level E1 in table 4. The level of performance shall be indicated by the band number (E1 to E3) given in table 4.

Table 4: Performance levels - Molten iron splash

performance levels	Molten iron splash index, g	
	min.	max.
E1	60	120
E2	121	200
E3	201	

NOTE 1: The end point of testing in EN 373 is when four successive tests on fresh specimens using the same weight of molten metal show no damage to the PVC film. Therefore, to ensure that a material meets the requirements for a particular grade in this European standard it is sufficient to conduct four tests using a weight of metal corresponding to the lower limit of the grade and to obtain no damage to the PVC film in all four tests.

iTeh STANDARD PREVIEW

NOTE 2: Acceptable performance in EN 373 against molten aluminium will normally ensure that a material will be acceptable against molten aluminium bronze and molten minerals.

SIST EN 531:1996

NOTE 3: Acceptable performance in EN 373 against molten iron will normally ensure that a material will be acceptable against molten copper, molten phosphor bronze and molten brass.

7 Additional garment requirements

The following features are required on garments designed to offer protection against molten metal splash.

- a) Jackets shall be long enough to cover the tops of the trousers even when the wearer is bending over.
- b) Trouser bottoms shall be long and wide enough to overlap the top of the footwear and shall have no turn ups.
- c) External pockets on jackets and overalls, where provided, shall be covered by flaps at least 20 mm wider than the pockets to avoid the flap being tucked into the pocket.
- d) Overlapping seams on the outside of the garments shall be downward facing and overlapped.
- e) Any metal fasteners on the outside of the garments shall be covered or treated to avoid the adhesion of molten metal.
- f) Quick release fastenings shall be provided to enable rapid removal in an emergency.
- g) Reinforced protection should be considered for the crotch area, shoulders and collar.

8 Marking

The marking shall be complete, clear and precise. All protective clothing which is claimed to comply with this European standard shall be marked with the following information:

- Name, trade mark or other identification means of the manufacturer or his authorized representative who is registered in the EEA;
- Type designation, trade name or code for clear identification;
- Size designation in accordance with EN 340;
- Pictogram as shown in figure 1, incorporating the number of this European standard and the performance levels recorded for property A (limited flame spread) and at least one other property, B to E.

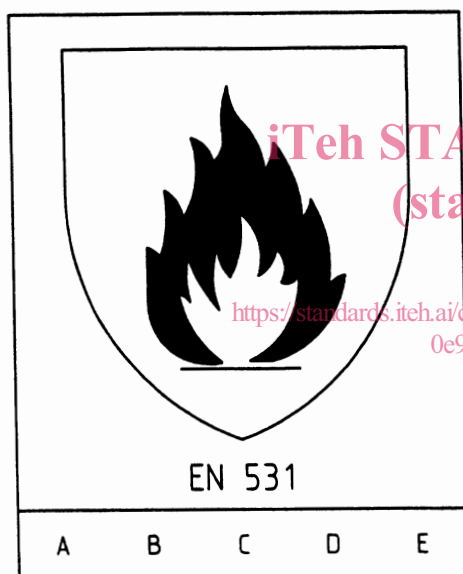


Figure 1: Pictogram - Clothing for protection against heat and flames.