



SLOVENSKI STANDARD

SIST EN 407:1996

01-februar-1996

Varovalne rokavice za zaščito pred učinki toplote in ognja

Protective gloves against thermal risks (Heat and/or fire)

Schutzhandschuhe gegen thermische Risiken (Hitze und/oder Feuer)

Gants de protection contre les risques thermiques (chaleur et/ou feu)

Ta slovenski standard je istoveten z: **EN 407:1994**

[SIST EN 407:1996](https://standards.iteh.ai/catalog/standards/sist/6b55b8f0-a070-4327-b59b-ac9432a6c9ee/sist-en-407-1996)

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ICS:

13.340.40 Varovanje dlani in rok Hand and arm protection

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EUROPEAN STANDARD

EN 407

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English version

Protective gloves against thermal risks (Heat and/or fire)

Gants de protection contre les risques
thermiques (chaleur et/ou feu)

Schutzhandschuhe gegen thermische Risiken
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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.

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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 was prepared by CEN/TC 162 "Protective clothing including hand and arm protection and lifejackets" of which the secretariat is held by DIN.

This European Standard has been prepared under a mandate given to CEN by the Commission of the European Communities 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of an identical text or by endorsement, at the latest by July 1994, and conflicting national standards shall be withdrawn at the latest by July 1994.

In accordance with the CEN/CENELEC Internal Regulations, 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 and United Kingdom.

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1 Scope

This Standard specifies test methods, general requirements, levels of thermal performance and the marking for protective gloves against heat and/or fire. It is to be used for all gloves which protect the hands against heat and/or flames in one or more of the following forms: fire, contact heat, convective heat, radiant heat, small splashes or large quantities of molten metal.

Product tests may only give performance levels and not protection levels.

2 Normative references

This European Standard incorporates by dated and undated references, provisions for 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 348 Protective clothing - Test method: Determination of behaviour of materials on impact of small splashes of molten metal
- 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 flames - Test method: Determination of the heat transmission on exposure to flame
- EN 373 Protective clothing - Assessment of resistance of materials to molten metal splash
- EN 388 Protective gloves against mechanical risks
- EN 420 General requirements for gloves
- prEN 702 Protective clothing - Protection against heat and fire - Test method: Determination of the contact heat transmission through protective clothing or its materials
- ISO 6941 Textile fabrics - Burning behaviour - Measurement of flame spread properties of vertically orientated specimens

3 Definitions

For the purposes of this standard the following definitions apply :

3.1 After flame time

The time in seconds from the removal of the ignition source until the extinction of the flame in the test specimen.

3.2 After glow time

The time in seconds from the extinction of the flame up to the cessation of glowing. If the sample is not ignited by the ignition source, but it glows after the removal of the ignition source, then the after glow time is measured from the time of removal of the ignition source.

3.3 Melting

The liquefaction of the material under the influence of heat.

3.4 Dripping

The detachment of molten droplets during the melting process.

4 General requirements

4.1 Sizes

The gloves shall correspond to the established requirements of EN 420. Unless requested differently by the user, protective gloves of performance levels 3 and 4 shall be manufactured so that they can easily be removed in case of emergency.

4.2 Abrasion

Using the test method 6.1 the material of the protective gloves shall correspond to at least performance level 1 of EN 388:1993, clause 4.

4.3 Tear Resistance

Using the test method 6.2 the material of the protective gloves shall correspond to at least performance level 1 of EN 388:1993, clause 4.

5 Thermal performance

For each of the following test methods the defined performance level depends upon the intended area of application of the glove. Only the tests which are relevant to the risks existing in the end-use application shall be carried out.

5.1 Burning behaviour

Using test method 6.3 the material shall correspond to the requirements of table 1

Table 1

Performance-level	After flame time s	After glow time s
1	≤ 20	no requirement
2	≤ 10	≤ 120
3	≤ 3	≤ 25
4	≤ 2	≤ 5

The materials shall not drip if the material melts. The seam must not come apart after an ignition time of 15 s in the test area.

5.2 Contact heat

Using the test method 6.4 the material shall correspond to the requirements of table 2.

Table 2

Performance level	Contact temp T °C	Threshold time t_t s
1	100	≥ 15
2	250	≥ 15
3	350	≥ 15
4	500	≥ 15

5.3 Convective heat

Using the test method 6.5 the material shall correspond to the requirements of table 3.

Table 3

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Performance level	Heat transfer index HTI
1	≥ 4
2	≥ 7
3	≥ 10
4	≥ 18

5.4 Radiant heat

Using the test method 6.6 the material shall correspond to the requirements of table 4.

Table 4

Performance level	Heat transfer t_3 s
1	≥ 5
2	≥ 30
3	≥ 90
4	≥ 150

5.5 Small splashes of molten metal

Using the test method 6.7 the number of droplets which produce a temperature rise of 40 °C, shall correspond to the requirements of table 5.

Table 5

Performance level	No. of droplets
1	≥ 5
2	≥ 15
3	≥ 25
4	≥ 35

5.6 Large quantities of molten metal

Using the test method 6.8 the PVC foil skin-simulant shall not exhibit any smoothness or other changes to the grained surface with any of the quantities of molten iron used. See table 6.

Table 6

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Performance level	Molten iron g
1	30
2	60
3	120
4	200

6 Test methods

For multilayered gloves, the tests are carried out simultaneously on all layers, even if these in some circumstances are no longer connected. This applies to test methods described in 6.4, 6.5, 6.6, 6.7, and 6.8.

6.1 Abrasion

Test according to EN 388.

6.2 Tear resistance

Test according to EN 388.

6.3 Burning behaviour

Test method is that given in ISO 6941 with the following modifications.

The burner is lighted and preheated for 2 min. The perpendicular flame height is adjusted to (40 ± 2) mm, the distance being measured between the burner tip and the yellow flame tip. The flame is viewed in a dim light. The glove is mounted vertically so that the point A (figure 1) is at the mid point of the lower edge.

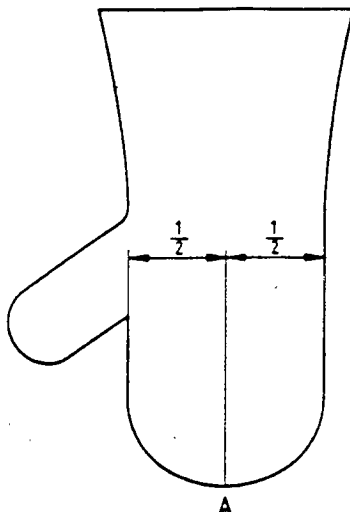


Figure 1

The burner is placed below the glove so that it is in a plane with the vertical middle line of the glove or the middle finger and is perpendicular to the surface of the glove. The burner is mounted at an angle of 30° to the vertical. The distance between the tip of the burner and the lower edge of the glove or the middle finger must be 20 mm.

One glove is tested for each ignition time, i. e. for 3 s and 15 s. The after flame time and after glow time are recorded for each ignition time (see table 1).

Moreover the material, if it melts, shall not drip and the seam shall not come apart in the burn test area.

6.4 Contact heat

Test method according to prEN 702.

From each palm area of three gloves one sample is taken with a diameter of 80 mm.

From the three single values for the threshold time t_t the arithmetic mean is calculated and stated to the nearest whole second.

6.5 Convective heat

The test method is that given in EN 367 with the following modifications:

The size of the test specimen shall be 140 mm x 140 mm. If it is not possible to take such a specimen from a glove then a material sample should be used, provided it was produced in the same way as the glove.

Samples of multilayered assemblies shall correspond to the usual order of the layers.

For each material type or material assembly, three specimens shall be tested. The arithmetic mean is calculated from the three single values and stated to the nearest whole second.