



SLOVENSKI STANDARD SIST EN 407:2020

01-junij-2020

Nadomešča:
SIST EN 407:2004

Varovalne rokavice in druga oprema za zaščito rok pred toplotnimi tveganji (toplote in/ali ognja)

Protective gloves and other hand protective equipments against thermal risks (heat and/or fire)

Schutzhandschuhe und andere Handschutzausrüstung gegen thermische Risiken (Hitze und/oder Feuer)

Gants de protection et autres équipements de protection de la main contre les risques thermiques (chaleur et/ou feu)

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SIST EN 407:2020
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Ta slovenski standard je istoveten z: EN 407:2020

ICS:

13.340.40 Varovanje dlani in rok Hand and arm protection

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EUROPEAN STANDARD

EN 407

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2020

ICS 13.340.40

Supersedes EN 407:2004

English Version

Protective gloves and other hand protective equipments against thermal risks (heat and/or fire)

Gants de protection et autres équipements protecteur
de la main contre les risques thermiques (chaleur
et/ou feu)

Schutzhandschuhe und andere Handschutzausrüstung
gegen thermische Risiken (Hitze und/oder Feuer)

This European Standard was approved by CEN on 21 October 2019.

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
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

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European foreword

This document (EN 407:2020) 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 October 2020, and conflicting national standards shall be withdrawn at the latest by April 2021.

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 supersedes EN 407:2004.

The major changes are:

- New tests 6.2, 6.3, 6.4, 6.8;
- Mechanical strength;
- Hand protective equipment;
- New pictogram Figure 7;
- Clause 8 (information supplied by the manufacturer: revised);
- New Annex A; [SIST EN 407:2020](https://standards.iteh.ai/catalog/standards/sist/609c4c14-07f8-4ae3-83b9-e85004f0f55a/sist-en-407-2020)
- New Annex B. <https://standards.iteh.ai/catalog/standards/sist/609c4c14-07f8-4ae3-83b9-e85004f0f55a/sist-en-407-2020>

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 Regulation.

For relationship with EU Regulation, see informative Annex ZA, which is an integral part of this document.

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

EN 407:2020 (E)**Introduction**

This document has been developed to cover all type of Personal Protective Equipment protecting the hand, a part of the hand or a part of the arm against thermal risks, no matter where they are used (professional use, consumer, domestic use...).

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1 Scope

This document specifies requirements, test methods, marking and information for protective gloves and other hand protective equipment's against thermal risks for professional use, consumer, domestic use.

This document is also applicable to arm protective equipment.

It is used for all gloves and other hand protective equipment's which protect the hands or part of the hand against heat and/or fire in one or more of the following forms: flame, contact heat, convective heat, radiant heat, small splashes or large quantities of molten metal.

This document is only applicable in conjunction with EN ISO 21420:2020.

This document does not apply to gloves for fire-fighters or welding that have their own standards.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 348:1992, *Protective clothing — Test method: Determination of behaviour of materials on impact of small splashes of molten metal*

EN ISO 21420:2020, *Protective gloves — General requirements and test methods (ISO 21420:2020)*

EN 659:2003+A1:2008, *Protective gloves for firefighters*

<https://standards.iteh.ai/catalog/standards/sist/609c4c14-07f8-4ae3-83b9->

EN ISO 6942:2002, *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)*

EN ISO 7500-1:2018, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system (ISO 7500-1:2018)*

EN ISO 9151:2016, *Protective clothing against heat and flame — Determination of heat transmission on exposure to flame (ISO 9151)*

EN ISO 9185:2007, *Protective clothing — Assessment of resistance of materials to molten metal splash (ISO 9185)*

EN ISO 12127-1:2015, *Clothing for protection against heat and flame — Determination of contact heat transmission through protective clothing or constituent materials — Part 1: Contact heat produced by heating cylinder (ISO 12127-1)*

EN ISO 15025:2016, *Protective clothing — Protection against flame — Method of test for limited flame spread (ISO 15025)*

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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 <https://www.iso.org/obp>

3.1
after flame time
 length of time for which a material continues to flame, under the specified test conditions, after the ignition source has been removed

3.2
afterglow time
 time for which a material continues to afterglow, under specified test conditions after cessation of after flaming or after removal of the ignition source

3.3
back of the glove
 back of hand, excluding fingers

3.4
char
 formation of a carbonaceous brittle residue when material is exposed to thermal energy

[SOURCE: EN ISO 15025:2016, 3.4]
 [16, 3.4] standards.iteh.ai/catalog/standards/sist/609c4c14-07f8-4ae3-83b9-e85004f0f55a/sist-en-407-2020

3.5
cuff
 part of the glove that extends beyond the opening of glove body to cover the wrist area and sometimes part of the forearm

3.6
debris
 material separating from the specimen during the test procedure and falling from the specimen without flaming

3.7
dripping
 detachment of molten droplets during the melting process

3.8
flaming debris
 material separating from the specimen during the test procedure and igniting the filter paper

3.9
hands protective equipment against thermal risks
 equipment which protect hand and/or areas of the hand intended to be exposed to thermal risks

Note 1 to entry: See examples in Annex A.

3.10

high thermal resistant gloves

gloves which claimed at least level 3 for one of the following properties: convective heat, contact heat, radiant heat, small metal splashes, large quantities of molten metal

3.11

hole

opening, break, or discontinuity of any size in the original structure of the test specimen's material caused by application of the test flame

3.12

melting

liquefaction of the material under the influence of heat

3.13

innermost layer

layer closest to the wearer's skin

3.14

reinforcement

additional layer which does not cover the full area where the protection is claimed

Note 1 to entry: Most of the time, this area has a limited surface to preserve comfort and dexterity of the gloves.

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4 General requirements (standards.iteh.ai)

4.1 General

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Where protection against other than thermal risk is needed the specific standard shall be used.

The protective gloves according to this document shall meet all the applicable requirements of EN ISO 21420:2020.

When parts of the glove are made from dissimilar materials, these dissimilar materials shall be tested separately, except if another way is specified in the standard. The results of each material shall comply with the requirements given in 4.5.

In those circumstances when the sample size is significantly larger than the particular part of the glove or hands protective equipment being tested, then the manufacturer shall be requested to supply samples of identical material.

4.2 Cleaning

All tests required in this document shall be performed on unused gloves or hand protective equipment unless otherwise specified.

If care instructions are provided, the relevant tests shall be performed on the gloves or hand protective equipment, before and after they have been subjected to the procedure described in the care instruction, including the maximum recommended number of cleaning cycles. The levels of performance and the mechanical strength (4.3) are given by the lowest of the 2 results obtained before and after cleaning.

NOTE Manufacturer's instructions typically indicate one or several of the various methods and processes of ISO 6330, ISO 15797 or equivalent as standardized processes for cleaning.

EN 407:2020 (E)**4.3 Mechanical strength**

The glove material(s) shall be tested according to 6.8. The tear strength resistance shall have at least a value of 10 N.

4.4 Sizes and dimensions**4.4.1 Gloves**

The gloves shall correspond to the relevant requirements of EN ISO 21420:2020.

If according the intended use, the hand protector needs to be taken off quickly, the protective gloves of performance levels 3 and 4 as specified in 4.5.2 to 4.5.7 shall be manufactured so that they can easily be removed in case of an emergency. The test shall be performed according to EN 659:2003+A1:2008, 3.15 using the same requirement. This property shall be justified and explained in a warning included in the manufacturer's information.

The removal test shall be carried out only in the dry state if the manufacturer's information states that the glove is not intended for use in wet conditions.

If protection against metal splashes as described in 4.5.6 and/or 4.5.7 is claimed, the minimal length of the glove shall correspond to the requirements of Table 1.

Table 1 — Minimal length of the glove

Size of the hand	5	6	7	8	9	10	11	12	13
Minimal length of glove (mm)	290	300	310	320	330	340	350	360	370

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4.4.2 Hand protective equipment's

Hand protective equipment's against thermal risks shall have a sufficient dimension to fully cover the part of the hand intended to be protected against thermal risk. The property shall be verified by visual inspection.

The manufacturer information shall contain precise information about how to use the hand protective equipment and which part of the hand is protected.

4.5 Thermal performances**4.5.1 General**

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

For the choice of relevant testing, examples are given in Annex B.

4.5.2 Limited flame spread

Using test method 6.2 the glove and other hand protective equipment, as well as all outer materials shall correspond to the requirements of Table 2. Surface of the innermost layer of the glove shall be inspected, it shall show no sign of melting. No hole shall appear on all layers of the tested area. The seam shall not come apart after the ignition time.

For high thermal resistant gloves (level 3 or 4), all outer materials different to the finger area shall be tested according to EN ISO 15025:2016, method A and comply at least with level 3 of Table 2. Seams and outer accessories with a surface area greater than 10 cm² shall also be tested.

If the outermost layer melts, the material shall not produce molten or flaming debris.

Table 2 — Performance levels for limited flame spread

Performance level	After flame time s	After glow time s
1	≤ 15	no requirement
2	≤ 10	≤ 120
3	≤ 3	≤ 25
4	≤ 2	≤ 5

After flame time is measured to the nearest second and after flame times of less than 1,0 s should be recorded as zero.

Afterglow time is measured to the nearest second and afterglow times of less than 1,0 s should be recorded as zero.

4.5.3 Contact heat

Using the test method 6.3 the material shall correspond to the requirements of Table 3.

Table 3 — Performance levels for contact heat test

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

For contact heat performance levels of 3 or 4, the limited flame spread test according to 6.2 shall be performed. The product shall reach at least level 3 in the limited flame spread test, otherwise the maximum contact heat performance that shall be reported is level 2.

Innermost layers of the glove shall be inspected, it shall show no sign of melting and holing.

4.5.4 Convective heat

Using the test method 6.4 the material shall correspond to the requirements of Table 4.

Table 4 — Performance levels for convective heat

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