SLOVENSKI STANDARD
SIST EN 659:2003+A1:2008

01-maj-2008

Zaščitne rokavice za gasilce

Protective gloves for firefighters

Feuerwehrschutzhandschuhe

Gants de protection pour sapeurs-pompiers

Ta slovenski standard je istoveten z: **EN 659:2003+A1:2008**

ICS:

13.220.10	Gašenje požara	Fire-fighting
13.340.40	Varovanje dlani in rok	Hand and arm protection

SIST EN 659:2003+A1:2008 **en,fr,de**

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Protective gloves for firefighters

Gants de protection pour sapeurs-pompiers

Feuerwehrschutzhandschuhe

This European Standard was approved by CEN on 7 February 2003 and includes Amendment 1 approved by CEN on 5 January 2008.

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

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Contents

Foreword

This document (EN 659:2003+A1:2008) 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 document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2008 and conflicting national standards shall be withdrawn at the latest by September 2008.

This document includes Amendment 1, approved by CEN on 2008-01-05.

This document supersedes ▌A1⟩ EN 659:2003 ⟨A1▌.

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.

Annex A is informative.

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Introduction

Suitable gloves for firefighters can enable the firefighters to work for long periods under hazardous conditions. However, it is not possible to relate the performance levels achieved in laboratory testing to protection levels under actual use conditions because the thermal hazards in wet and dry conditions may be very different.

1 Scope

This European Standard defines minimum performance requirements and test methods for firefighters' protective gloves.

This European Standard applies only to firefighters' protective gloves which protect the hands during normal firefighting, including search and rescue.

These gloves are not intended for deliberate handling of liquid chemicals, but provide some protection against accidental contact with chemicals.

Protective gloves for special operations within firefighting service are excluded from the scope of this standard.

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 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 (including amendments).

A1⟩ *deleted text* ⟨A1

EN 367, *Protective clothing — Protection against heat and fire — Method of determining heat transmission on exposure to flames*

A1⟩ *deleted text* ⟨A1

EN 388, *Protective gloves against mechanical risks*

EN 407, *Protective gloves against thermal risks (heat and/or fire)*

A1⟩ EN 420:2003, *Protective gloves — General requirements and test methods* ⟨A1

EN 702, *Protective clothing — Protection against heat and flame — Test method: Determination of the contact heat transmission through protective clothing or its materials*

EN 20811, *Textile — Determination of resistance to water penetration — Hydrostatic pressure test*

A1⟩ EN ISO 6530, *Protective clothing — Protection against liquid chemicals — Test method for resistance of materials to penetration by liquids (ISO 6530:2005)* ⟨A1

EN 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 6942:2002)*

EN 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 13935-2:1999)*

[A1] EN ISO 20344:2004, *Personal protective equipment — Test methods for footwear (ISO 20344:2004)* [A1]

ISO 15383, *Protective gloves for firefighters — Laboratory test methods and performance requirements*

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

3 Requirements

3.1 General requirements

Firefighters' protective gloves shall [A1] conform to [A1] all the general requirements of EN 420 except the lengths which are defined in 3.2.

When parts of the palm and/or parts of the back of the glove are made from dissimilar materials, these dissimilar materials shall be tested separately. In those circumstances when the sample size is significantly larger than the particular part of the glove being tested, then the manufacturer shall be requested to supply samples of the appropriate materials.

After each thermal test (3.7, 3.8, 3.9, 3.10), the innermost lining material shall be visually inspected. The glove is deemed to have failed the test if there is evidence of melting.

3.2 Sizes

When measured according to [A1] 6.1 of EN 420:2003 [A1], the sizes shall correspond with those requirements established in the applicable clause of EN 420, but the minimum length shall be in accordance with table 1.

[A1] Table [A1] 1 — Minimum length of protective gloves for firefighters

Glove size	6	7	8	9	10	11
Fits	hands size 6	hands size 7	hands size 8	hands size 9	hands size 10	hands size 11
Minimum length of glove (mm)	260	270	280	290	305	315

NOTE The user should take care that the gloves are compatible with the sleeves of the selected protective clothing and ensure that no skin is exposed when the arms are stretched.

3.3 Abrasion resistance

The glove shall be tested according to the appropriate clause of EN 388, on the palm of the glove. When tested accordingly, it shall be in accordance with at least performance level 3 (2 000 cycles).

3.4 Cut resistance

The glove shall be tested according to the appropriate clause of EN 388, both on the palm and the back of the glove. When tested accordingly, it shall be in accordance with at least performance level 2 (index 2.5).

3.5 Tear resistance

The glove shall be tested according to the appropriate clause of EN 388, on the palm of the glove. When tested accordingly, it shall be in accordance with at least performance level 3 (50 N).

3.6 Puncture resistance

The glove shall be tested according to the appropriate clause of EN 388, on the palm of the glove. When tested accordingly, it shall be in accordance with at least performance level 3 (100 N).

3.7 Burning behaviour

The glove shall be tested according to the appropriate clause of EN 407. When tested accordingly, it shall be in accordance with performance level 4 (after flame time $\leq$ 2 s and after glow time $\leq$ 5 s).

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

3.8 Convective heat resistance

The material for firefighters' protective gloves shall be tested according to EN 367, both on the back and the palm of the glove. For each material or each material assembly, three samples shall be tested. When tested accordingly, each sample shall be in accordance with at least performance level 3 ($HTI_{24} \geq 13$) of EN 407. The result shall be given as the arithmetic mean of the three individual values and rounded to the nearest whole second.

3.9 Radiant heat resistance

[A1⟩ A sample of size 80 mm × 170 mm shall be taken from the backs of three individual fire-fighters' gloves and tested according to EN ISO 6942 with a heat flux of 40 kW/m². The value of RHTI 24 is calculated as the arithmetic mean of three values of t_{24} and stated to the nearest whole second. When tested accordingly, the value RHTI 24 shall be at least 20 and no individual value shall be less than 18. ⟨A1]

3.10 Contact heat resistance

The material for firefighters' protective gloves shall be tested according to EN 702, on the palm of the glove, with a contact temperature of 250°C. A sample with a diameter of 80 mm is taken from each palm area of three gloves. When tested accordingly, each sample shall have a threshold time t_t of at least 10 s.

The gloves shall be tested both after wet conditioning (according to the relevant clause on pretreatments of ISO 15383) and dry conditioning (according to clause 4).

For each conditioning, the arithmetic mean of the three individual values shall be calculated and rounded to the nearest whole second. The lowest mean shall be given as the test result.

3.11 Heat resistance of the lining material

The lining material closest to the skin, when tested according to ISO 17493 at a minimum temperature of 180 °C, shall not melt, drip or ignite.

3.12 Heat shrinkage

The glove, when tested according to ISO 17493 at 180°C shall not shrink more than 5 %.

3.13 Dexterity

The glove shall be tested according to the dexterity test described in EN 420. When tested accordingly, the glove shall be in accordance with at least performance level 1 (smallest diameter of pin: 11 mm).

3.14 Seam breaking strength

When tested according to EN ISO 13935-2, the seam breaking force shall be at least 350 N.

3.15 Time for the removal of gloves

Three pairs of gloves shall be donned and then removed by a test subject, after conditioning according to clause 4. The time for removal of each pair shall be recorded. The mean value shall be calculated and rounded to the nearest whole second.

This procedure shall be repeated after wet conditioning of three new pairs of gloves according to the relevant clause of ISO 15383 (without applying a pressure of 3,5 kPa).

The mean value of time for removal of a pair of gloves, whether they are dry or wet, shall not be greater than 3 s.

3.16 Resistance of glove material to water penetration (optional)

If required for the application, material of the glove shall be tested for resistance to water penetration in accordance with the appropriate test method as follows:

— For leather: [A1] 6.13 of EN ISO 20344:2004 [A1]. The results shall be reported according to Table *2*.

— For textile: EN 20811. The results shall be reported in accordance with EN 20811.

[A1] Table [A1] 2 — Levels of performance - Resistance to water penetration according to [A1] 6.13 of EN ISO 20344:2004 [A1]

Performance level	Time of penetration (min)
1	30
2	60
3	120
4	180

3.17 Whole glove integrity test

If, for the end user, it is necessary to have waterproof gloves, then the glove shall be tested according to the relevant test method in ISO 15383, but with complete immersion of the glove up to the wrist line only.

3.18 Resistance to liquid chemical penetration

Glove material shall be tested according to [A1] EN ISO 6530 [A1], at 20 °C, using an application time of 10 s, with the following test chemicals:

— 30 % by weight H_2SO_4;

— 40 % by weight NaOH;

— 36 % by weight HCl;

— o-xylene.

When tested accordingly, there shall be no penetration.

4 Preconditioning and testing conditions

Before testing, the test samples shall be conditioned for at least 24 h in the following conditioning atmosphere.

— Temperature (20 ± 2) °C;