



**SLOVENSKI STANDARD**  
**SIST EN 60903:2000/A11:2000**  
**01-april-2000**

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**Specification for gloves and mitts of insulating material for live working -  
Amendment A11**

Specification for gloves and mitts of insulating material for live working

Norm für Handschuhe aus isolierendem Material zum Arbeiten an unter Spannung stehenden Teilen

Spécification pour gants et moufles en matériaux isolants pour travaux électriques

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**Ta slovenski standard je istoveten z: EN 60903:1992/A11:1997**

SIST EN 60903:2000/A11:2000  
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**ICS:**

13.260	Varstvo pred električnim udarom. Delo pod napetostjo	Protection against electric shock. Live working
13.340.40	Varovanje dlani in rok	Hand and arm protection

**SIST EN 60903:2000/A11:2000**                      **en**

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EUROPEAN STANDARD

EN 60903/A11

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 1997

UDC 621.315.6:614.896.2  
ICS 13.340.10

Descriptors: Live working, electrical equipment, insulating glove, rubber, characteristic, dimension, test

English version

**Specification for gloves and mitts of  
insulating material for live working**Spécification pour gants et moufles  
en matériaux isolants pour travaux  
électriquesHandschuhe aus isolierendem Material  
zum Arbeiten an unter Spannung  
stehenden Teilen**iTeh STANDARD PREVIEW  
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b325-a61b6b913554/sist-en-60903-2000-a11-2000](https://standards.iteh.ai/catalog/standards/sist/436b77db-6223-4a14-b325-a61b6b913554/sist-en-60903-2000-a11-2000)

This amendment A11 modifies the European Standard EN 60903:1992; it was approved by CENELEC on 1997-03-11. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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

**CENELEC**European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

This amendment was prepared by the Technical Committee CENELEC TC 78, Equipment and tools for live working.

It comprises the texts of two draft amendments.

The text of prAB was submitted to the formal vote and was approved by CENELEC on 1996-10-01 for inclusion into the future amendment A11.

The text of prAA was submitted to the Unique Acceptance Procedure and was approved by CENELEC as amendment A11 to EN 60903:1992 on 1997-03-11.

The following dates were fixed:

- latest date by which the amendment has to be implemented  
at national level by publication of an identical  
national standard or by endorsement (dop) 1997-12-01
  - latest date by which the national standards conflicting  
with the amendment have to be withdrawn (dow) 1997-12-01
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## Appendix A

Replace the appendix by:

**Annex A**  
(normative)

**Electrical limits for the use of gloves and mitts  
of insulating material**

**A.1 General**

The correct use of gloves and mitts to this standard is determined by the following electrical conditions of the installation, both as defined in ENV 50196:

- the highest voltage system;
- the required insulation level for live working (RILL).

**A.2 Limits when no additional tests are made**

Limits for the use of gloves and mitts versus the highest voltage of the system are indicated in table A.1 below.

**Table A.1 - Electrical a.c. limits**

Class	Highest voltage of the system $U_s$ kV r.m.s.
00	0,5
0	1
1	7,5
2	17
3	26,5
4	36

$U_s$  is an operative phase-to-phase value such as specified for the system. If this actual value is not known, it shall be set equal to the highest value for equipment  $U_m$ .

On an earthed, neutral star circuit (grounded wye), if there is no multiphase exposure in the working area because electrical conductors and equipment are insulated or isolated, or both, the phase-to-earth voltage can be considered to be the nominal voltage.

When no dielectric tests in addition to those stipulated in 6.4 are made, the limits of applicability, versus the RILL valid up to an altitude of the work location of 1 000 m above sea level, are indicated in table A.2 below.

**Table A.2 - Electrical peak limits**

Class	RILL $U_{90r}$ kV peak
00	*)
0	*)
1	34
2	52
3	69
4	86
*) under consideration	

When the product complies with the standard for a given class, it can be used on systems for which the RILL is lower or equal to the value given in table A.2 for the same class.

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NOTE 1: Considering that the RILL is a characteristic of power systems and operating conditions of these systems during live working, it is up to the user to select the appropriate RILL value. Consequently, products of classes lower than the one resulting from table A.1 can be used if the system is characterised by a RILL value lower or equal to the one given in table A.2 for this class. Conversely, a product of a given class cannot be used on a power system corresponding to table A.1, if the RILL value of the system is higher than the one given by table A.2 for the same class (see A.3)

NOTE 2: The RILL requires that the product at the altitude of work location, has a  $U_{90}$  at least equal to the value of the RILL, when  $U_{90}$  is the statistical withstand voltage for the standard switching impulse 250/2500  $\mu$ s with 90 % probability of being withstood.

When tested as stipulated in 6.4, the product is not submitted to a switching impulse withstand test but only to the a.c. withstand voltage test as described in 6.4.2.3.

However, comparative tests performed in laboratories of various countries in the world have shown some equivalence in result between the switching impulse withstand voltage  $U_{90}$  and the a.c. withstand test voltage.

Under the assumption that the a.c. withstand test has been performed at sea level, the equivalent switching impulse withstand voltage at an altitude higher than sea level is given by the formula

$$U_{90} = F \times k_a \times \sqrt{2} \times U_B \quad \text{in kV peak}$$

with

$F$  = equivalence factor

$k_a$  = altitude factor, in accordance with ENV 50196

$U_B$  = a.c. withstand test voltage, in accordance with 6.4.2.3.

The RILL values of table A.2 are calculated, assuming

$$U_{90r} = U_{90}$$

$$\text{and } F = 1,3$$

$$\text{and } k_a = 0,938, \text{ corresponding to an altitude of 1 000 m and a RILL of up to 200 kV.}$$

### A.3 Limits when additional tests are made

Products of this standard may be used for higher values of RILL than indicated in table A.2 if it had been proved by switching impulse type test that they have the required withstand voltage  $U_{90}$ . The replacement of the impulse test by an a.c. test shall not be acceptable in this case.

If the required  $U_{90r}$  is only granted on a partial length or surface of the product, this partial length or surface shall also be established by test and shall be clearly indicated.

The tests shall be performed in accordance with IEC 60 series and with test test voltages corrected such that the confirmed limit value of the RILL is valid for altitudes up to 1000 m above sea level.

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## Appendix E

Replace the appendix by:

**Annex E**  
(normative)**Sampling procedure****E.1 General**

The sampling procedure does not follow in the entirety the sampling procedure developed in IEC 410:1973. The product covered by this standard does not lend itself to the application of the above mentioned standard, due to its nature.

The sampling procedure used in conjunction with this standard on gloves has been specially developed based on the quality assurance practices of the ISO 9000 series. When those requirements are not followed, the procedure of this annex is applicable.

**E.2 Classification of defects**

Defects are classified as major or minor (see definition in IEC 410).

Table E.1 gives the nature of defects in function of the tests retained for the sampling procedure.

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**Table E.1 - Classification of defects**

Description of test	Subclause	Type of defect	
		Minor	Major
<b>Visual (6.2)</b>			
Shape	6.2.1	X	
Dimensions	6.2.2	X	
Thickness	6.2.3	X	
Workmanship and finish	6.2.4	X	
Marking	6.2.5		X
Packaging	6.2.6		X
<b>Mechanical (6.3)</b>			
Tensile strength and elongation at break	6.3.2		X
Puncture resistance	6.3.3		X
Tension set	6.3.4		X
<b>Dielectric (6.4)</b>			
Voltage proof (3 min)	6.4.3.1		X
Voltage withstand	6.4.3.2		X
<b>Ageing</b>	6.5	X	
<b>Thermal (6.6)</b>			
Flame retardancy	6.6.1	X	
Low temperature	6.6.2	X	



**E.3 General Sampling Plan****E.3.1 Plans for minor defects (AQL 10)****Table E.2 - Sampling plan for minor defects**

Lot	Sample size	Number of defects for acceptance	Number of defects for rejection
2 to 90	5	0	1
91 to 150	8	2	3
151 to 3 200	13	3	4
3 201 to 35 000	20	5	6

**E.3.2 Plans for major defects (AQL 4,0)****Table E.3 - Sampling plan for major defect**

Lot	Sample size	Number of defects for acceptance	Number of defects for rejection
2 to 90	3	0	1
91 to 3 200	13	1	2
3 201 to 35 000	20	2	3

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**E.4 Sampling procedure (for gloves with special properties)**

A first sample of gloves with special properties shall be selected in accordance with the sampling plans given in table E.2 and table E.3.

In addition, a second sample shall be selected in accordance with table E.3 and submitted to the tests given in clause 7, for each respective special category.

**E.5 Procedure when the testing is carried out in a laboratory other than the manufacturer's**

If during the dielectric tests, the gloves in a lot or batch fail to meet the requirements of 6.4, the testing shall be terminated and the manufacturer or supplier notified.

In such a case, the manufacturer or supplier may ask the customer or testing laboratory to submit proof that the test procedure and equipment conform to the applicable clauses of this standard.

When such a proof has been established, the manufacturer or supplier may request that his representative witness the testing of additional gloves from the shipment.

All rejected lots shall be returned as directed by the manufacturer or supplier without permanent marking. However, gloves punctured when tested in accordance with 6.4, shall be stamped, punched or cut prior to being returned to the supplier to indicate that they are unfit for electrical use.