SLOVENSKI STANDARD
SIST EN 60984:2000/A11:2000

01-april-2000

Rokavi iz izolacijskega materiala za delo pod napetostjo – Dopolnilo 11

Sleeves of insulating material for live working

Isolierende Ärmel zum Arbeiten unter Spannung

Protège-bras en matériaux isolants pour travaux électriques

Ta slovenski standard je istoveten z: **EN 60984:1992/A11:1997**

ICS:

13.260	Varstvo pred električnim udarom. Delo pod napetostjo	Protection against electric shock. Live working
13.340.10	Varovalna obleka	Protective clothing

SIST EN 60984:2000/A11:2000 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

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EN 60984/A11

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Descriptors: Electrical insulation, work safety, accident prevention, protection against electrical contact, dimensions, tests, protective clothing, arm

English version

Sleeves of insulating material for live working

Protège-bras en matériaux isolants pour travaux électriques

Isolierende Ärmel zum Arbeiten unter Spannung

This amendment A11 modifies the European Standard EN 60984:1992; 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.

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CENELEC

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

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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 60984:1992 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

Appendix A

Replace the appendix by:

Annex A
(normative)

Electrical limits for the use of sleeves of insulating material

A.1 General

The correct use of sleeves 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 sleeves 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.

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 µs 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

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

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}

and F = 1,3

and k_a = 0,938, 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 1 000 m above sea level.

Appendix E

Replace the appendix by:

Annex E
(normative)

Sampling procedure

E.1 General

The sampling procedure does not follow in the enterity 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 sleeves 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.

Table E.1 - Classification of defects

Description of test	Subclause	Type of defect	
		Minor	Major
Visual (6.2)			
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
Mechanical (6.3)			
Tensile strength and elongation at break	6.3.2		X
Puncture resistance	6.3.3		X
Tension set	6.3.4		X
Dielectric (6.4)			
Test procedure	6.4.5.2		X
Optional complementary test	6.4.5.3		X
Ageing	6.5	X	
Thermal (6.6)			
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

E.4 Sampling procedure for sleeves with special properties

A first sample of sleeves 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 sleeves 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 sleeves from the shipment.

All rejected lots shall be returned as directed by the manufacturer or supplier without permanent marking. However, sleeves 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.