SLOVENSKI STANDARD
SIST EN 60984:2000

01-junij-2000

Rokavi iz izolacijskega materiala za delo pod napetostjo (IEC 60984:1990 (Spremenjen))

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**

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 **en**

EUROPEAN STANDARD EN 60984

NORME EUROPEENNE

EUROPÄISCHE NORM October 1992

UDC 621.3.002.54:621.3.027.4:614.896.1

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
(IEC 984:1990, modified)

Protège-bras en matériaux isolants pour travaux électriques
(CEI 984:1990, modifiée)

Isolierende Ärmel zum Arbeiten unter Spannung

(IEC 984:1990, modifiziert)

This European Standard was approved by CENELEC on 1992-09-15. CENELEC 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 Central Secretariat or to any CENELEC 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 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

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 984:1990 could be accepted without textual changes, has shown that some common modifications were necessary for the acceptance as European Standard.

The reference document, together with the common modifications prepared by the CENELEC Technical Committee TC 78, was submitted to the CENELEC members for formal vote.

The text of the draft was approved by CENELEC as EN 60984 on 15 September 1992.

The following dates were fixed:

- latest date of publication of an identical national standard	(dop)	1993-09-01
- latest date of withdrawal of conflicting national standards	(dow)	1993-09-01

For products which have complied with the relevant national standard before 1993-09-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1998-09-01.

Annexes and appendices designated "normative" are part of the body of the standard. Annexes and appendices designated "informative" are given only for information. In this standard, appendices C and D and annex ZA are normative, appendices F and G are informative.

ENDORSEMENT NOTICE

The text of the International Standard IEC 984:1990 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

4 Classification

Replace the note by:

NOTE: Guidance for use will be given in Appendix A (under consideration).

5 Physical requirements

5.5.2 **Replace** "petrol (gasoline)" by "denatured alcohol".

5.6 **Add** "and in accordance with any national regulation" after "of the customer".

6 Tests on sleeves

6.1 In the last paragraph **add** "relative humidity" after "50 ± 5 %".

6.3.3 In the second paragraph **delete** "included" before "angle of 12°".

6.4.1 After the first paragraph **add**:

NOTE: The equivalence of d.c. tests and a.c. tests is under consideration and consequently the values of d.c. test voltages are under consideration.

6.4.6.2 **Delete** the values under d.c. average kV in table V for all classes.

7 Tests on sleeves with special properties

7.4.1 **Replace** "(50 ± 5 parts per hundred million by volume)" by "(0,54 ppm ± 10 % by volume)".

7.4.2 **Replace** "(50 ± 5 parts per hundred million by volume)" by "(0,54 ppm ± 10 % by volume)".

Appendices

Appendix A **Replace** the text by "Reserved".

COMMON MODIFICATIONS

Appendix C **Add** "(normative)".
Replace the table by the following.

GENERAL TEST PROCEDURE

Description of test	Clause or Sub-clause	Type tests							Routine tests
		Lot 1	Lot 2	Lot 3	Lot 4	Lot 5 A	Lot 6 H	Lot 7 Z	
Visual (6.2)									
Shape	6.2.1	1							
Dimensions	6.2.2	2							
Thickness	6.2.3	3	1	1	1	1	1	1	
Workmanship and finish	6.2.4	4							
Marking	6.2.5	5							1
Packaging	6.2.6	6							
Mechanical (6.3)									
Tensile strength and elongation at break	6.3.2	7	3						
Puncture resistance	6.3.3	8							
Tension set	6.3.4	9	4						
Dielectric (6.4)									
– A.C. voltage	6.4.5			2 *e)*	3 *e)*				2 *e)*
– D.C. voltage	6.4.6			3 *e)*	4 *e)*				3 *e)*
Ageing (6.5)	6.5		2						
Thermal (6.6)									
Flame retardancy	6.6.1	10							
Low temperature resistance	6.6.2				2 *d)*				
Special properties (7)									
Category A – Acid resistance	7.2					2			
Category H – Oil resistance	7.3						2		
Category Z – Ozone resistance	7.4							2	
Category S – Oil and ozone resistance	7.5								
Category C – Extreme low temperature	7.6 *c)*				*d)*				
Size of each lot (the unit is the sleeve)		1	1	3	3	4	4	2	

The numbers given in the table indicate the order in which the tests are to be made.

c) **Conforms if it meets requirements of Sub-clauses 7.2, 7.3 and 7.4.**

d) **Values specified are different in the case of sleeves of Category C.**

e) **By agreement between the manufacturer and the customer, either the a.c. or the d.c. tests shall be used.**

Notes.- **The acceptance tests are made by agreement between manufacturer and customer.**

The numbers given in the table indicate the order in which the tests are to be made.

The sampling tests are the same as those for type tests.

The size of each lot for sampling tests is given in Appendix E.

Sleeves which have been subjected to type tests or sampling tests shall not be reused.

COMMON MODIFICATIONS

Appendix D **Add** "(normative)".

Appendix E **Replace** the text by "Reserved".

Appendix F **Add** "(informative)".

Delete the last paragraph of F1.

Appendix G **Add** "(informative)".

Figures

Fig. 3 **Delete** "mm" after "2.5" in the drawing "Typical location".

Add to note 1: "; tolerances are ± 10 %".

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC Publication	Date	Title	EN/HD	Date
50(121)	1978	International Electrotechnical Vocabulary (IEV) Chapter 121: Electromagnetism	-	-
50(151)	1978	Chapter 151: Electrical and magnetic devices	-	-
50(601)	1985	Chapter 601: Generation, transmission and distribution of electricity General	-	-
60-1	1973*	High-voltage test techniques Part 1: General definitions and test requirements	-	-
212	1971	Standard conditions for use prior to and during the testing of solid eletrical insulating materials	HD 437 S1	1984
410	1973	Sampling plans and procedures for inspection by attributes	-	-
707	1981	Methods of test for the determination of the flammability of solid electrical insulating materials when exposed to an igniting source	HD 441 S1	1983

* IEC 60-1:1973 is superseded by IEC 60-1:1989 which is endorsed by HD 588 S1:1991

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60984

Première édition
First edition
1990-02

Protège-bras en matériaux isolants pour travaux électriques

Sleeves of insulating material for live working

International Electrotechnical Commission 3, rue de Varembé Geneva, Switzerland
Telefax: +41 22 919 0300 e-mail: inmail@iec.ch IEC web site http: //www.iec.ch

IEC Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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For price, see current catalogue

Publication 60984 de la CEI
(Premi re dition – 1990)

Prot ge-bras en mat riaux isolants pour travaux lectriques –

IEC Publication 60984
(First edition – 1990)

Sleeves of insulating materiel for live working –

CORRIGENDUM 1

Le comit technique 78 est toujours attentif l'emploi en travaux sous tension de mat riaux et de produits chimiques qui, tout en tant ad quats, assurent la sant et la s curit au travail ainsi que la protection de l'environnement. En cons quence, un solvant ad quat a t identifi pour remplacer le trichloro-1,1,2 trifluoro-1,2,2 thane (aussi connu sous les appellations trifluorotrichloro thane, Fr on et R frig rant 113), utilis au pr alable.

Technical committee 78 continues to monitor the use of chemicals and materials in live working that are suitable and provide for safety, occupational health and environmental protection. As a result, a suitable solvent has been found to replace the previously used trichloro-1,1,2 trifluoro-1,2,2 ethane (also known as trifluorotrichloroethane, Freon and Refrigerant 113).

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6.4.2.3 Electrodes liquides, montage droit

6.4.2.3 Water electrodes, straight mounting

Note 2, premi re phrase

Au lieu de:

Un liquide di lectrique satisfaisant est le trichlorotrifluor thane (r frig rant 113).

lire:

Deux liquides di lectriques satisfaisants sont le m thoxy-nonafluorobutane ($C_4F_9OCH_3$) et le 2,3-dihydrod cafluoropentane ($C_5H_2F_{10}$).

Ajouter la note 5 suivante:

NOTE Il est du devoir d'un employeur de s'assurer que la l gislation applicable ainsi que les prescriptions de s curit propres l'usage du produit chimique utilis sont respect es int gralement.

Note 2, first sentence

Instead of:

One satisfactory dielectric liquid is trichlorotrifluoroethane (Refrigerant 113).

read:

Two satisfactory dielectric liquids are methoxy-nonafluorobutane ($C_4F_9OCH_3$) and 2,3-dihydrodecafluoropentane ($C_5H_2F_{10}$).

Add the following note 5:

NOTE It is the duty of an employer to ensure that the relevant legislation and safety requirements for the use of the selected chemical are complied with in their entirety.

CEI 60984
(Premi re dition – 1990)

Prot ge-bras en mat riaux isolants pour travaux lectriques

IEC 60984
(First edition – 1990)

Sleeves of insulating material for live working

CORRIGENDUM 2

Page 4

PR FACE

Supprimer:

410 (1973): *Plans et r gles d' chantillonnage pour les contr les par attributs.*

Ajouter la publication suivante:

ISO 2859-1 :1999, *R gles d' chantillonnage pour les contr les par attributs – Partie 1: Proc dures d' chantillonnage pour les contr les lot par lot, index s d'apr s le niveau de qualit acceptable (NQA)*

Page 5

PREFACE

Delete:

410 (1973): *Sampling plans and procedures for inspection by attributes.*

Add the following publication:

ISO 2859-1:1999, *Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

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Annexe E

E1. G n ralit s

Premier alin a

Au lieu de:

... la Publication 410 de la CEI.

lire:

... l'ISO 2859-1.

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Appendix E

E1. General

First paragraph

Instead of:

... IEC Publication 410.

read:

... ISO 2859-1.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SLEEVES OF INSULATING MATERIAL FOR LIVE WORKING

FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.

3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

4) The IEC has not laid down any procedure concerning marking as an indication of approval and has no responsibility when an item of equipment is declared to comply with one of its recommendations.

PREFACE

This standard has been prepared by IEC Technical Committee No. 78: Tools for live working.

The text of this publication is based upon the following documents:

Six Months' Rule	Reports on Voting
78(CO)24 + 24A	78(CO)26 + 26A

Full information on the voting for the approval of this standard can be found in the Voting Reports indicated in the above table.

The following IEC publications are quoted in this standard:

Publications Nos.	50(121) (1978):	International Electrotechnical Vocabulary (IEV), Chapter 121: Electromagnetism.
	50(151) (1978):	Chapter 151: Electrical and magnetic devices.
	50(601) (1985):	Chapter 601: Generation, transmission and distribution of electricity - General.
	60-1 (1973):	High-voltage test techniques, Part 1: General definitions and test requirements.
	212 (1971):	Standard conditions for use prior to and during the testing of solid electrical insulating materials.
	410 (1973):	Sampling plans and procedures for inspection by attributes.
	707 (1981):	Methods of test for the determination of the flammability of solid electrical insulating materials when exposed to an igniting source.

SLEEVES OF INSULATING MATERIAL FOR LIVE WORKING

1. Scope

This international standard is applicable to insulating sleeves for the protection of workers from accidental contact with live electrical conductors, apparatus or circuits.

1.1 Five classes of sleeve, differing in electrical characteristics, are provided and designated as: Class 0, Class 1, Class 2, Class 3 and Class 4.

1.2 Five categories of sleeve with different properties are provided, related to the following: resistance to acid, resistance to oil, resistance to ozone, combined resistance to oil and ozone, and also resistance to extreme low temperature. These are designated as Categories A, H, Z, S and C respectively.

1.3 Two styles of sleeve, differing in configuration, are provided and designated as straight taper and curved elbow.

2. Definitions

For the purpose of this standard, the terms hereafter have the following meanings:

Elastomer

A generic term that includes rubbers, latex and elastomeric compounds that may be natural or synthetic, or a mixture, or a combination of both.

Type test

A test of one or more devices made to a certain design to show that the design meets certain specifications. (IEV* 151-04-15).

Routine test

A test to which each individual device is subjected during or after manufacture to ascertain whether it complies with certain criteria (IEV 151-04-16).

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* See the International Electrotechnical Vocabulary (IEV) (IEC Publication 50).

Sampling test

A test on a number of devices taken at random from a batch. (IEV 151-04-17).

Acceptance test

A contractual test to prove to the customer that the device meets certain conditions of its specification (IEV 151-04-20).

Shoulder roll

The rolled or reinforced edge of an insulating sleeve nearest to the shoulder.

Cuff roll

The roll or reinforced edge of a sleeve at the cuff.

Electrical puncture

A disruptive breakdown through a solid insulant (IEV 121-03-13).

Flashover

An arc by-passing an insulating body (IEV 121-03-14).

Nominal voltage

A suitable approximate value of voltage used to designate or identify a system (IEV 601-01-21).

3. Composition

The sleeves shall be manufactured of elastomers and produced by a seamless process. The holes provided in sleeves, for the purposes of strap or harness attachments, shall have non-metallic reinforced edges, and shall be nominally 8 mm in diameter.

4. Classification

The sleeves covered under this standard shall be designated as follows:

- by class as Class 0, Class 1, Class 2, Class 3 and Class 4;
- by special properties, by the addition of a suffix as shown in table I;
- by style as described in Sub-clause 4.1.1.