



SLOVENSKI STANDARD

SIST EN 60544-5:2012

01-julij-2012

Nadomešča:
SIST EN 60544-5:2004

**Električni izolacijski materiali - Ugotavljanje učinkov ionizirnega sevanja - 5. del:
Postopki za ocenjevanje staranja med uporabo**

Electrical insulating materials - Determination of the effects of ionising radiation - Part 5:
Procedures for assessment of ageing in service

Elektroisolierstoffe - Bestimmung der Wirkung ionisierender Strahlung - Teil 5 :
Bewertungsverfahren für die Alterung während des Einsatzes

Matériaux isolants - Détermination des effets des rayonnements ionisants - Partie 5:
Procédures pour l'estimation du vieillissement en service

Ta slovenski standard je istoveten z: EN 60544-5:2012

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29.035.01	Izolacijski materiali na splošno	Insulating materials in general
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NORME EUROPÉENNE
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**Electrical insulating materials -
Determination of the effects of ionizing radiation -
Part 5: Procedures for assessment of ageing in service
(IEC 60544-5:2011)**

Matériaux isolants -
Détermination des effets des
rayonnements ionisants -
Partie 5: Procédures pour l'estimation du
vieillessement en service
(CEI 60544-5:2011)

Elektroisolierstoffe -
Bestimmung der Wirkung ionisierender
Strahlung -
Teil 5: Bewertungsverfahren für die
Alterung während des Einsatzes
(IEC 60544-5:2011)

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CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 112/171/CDV, future edition 2 of IEC 60544-5, prepared by IEC TC 112, "Evaluation and qualification of electrical insulating materials and systems", was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60544-5:2012.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2012-10-18
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-01-18

This document supersedes EN 60544-5:2003.

EN 60544-5:2012 constitutes an editorial revision to align it with standards recently developed by SC 45A as well as with other parts in the EN 60544 series.

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In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60544-4 NOTE Harmonized as EN 60544-4.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60544-1	-	Electrical insulating materials - Determination of the effects of ionizing radiation - Part 1: Radiation interaction and dosimetry	EN 60544-1	-
IEC 60544-2	-	Guide for determining the effects of ionizing radiation on insulating materials - Part 2: Procedures for irradiation and test	-	-
IEC 60780	-	Nuclear power plants - Electrical equipment of the safety system - Qualification	-	-
IEC/TR 61244-1	-	Determination of long-term radiation ageing in polymers - Part 1: Techniques for monitoring diffusion-limited oxidation	-	-
IEC/TR 61244-2	-	Determination of long-term radiation ageing in polymers - Part 2: Procedures for predicting ageing at low dose rates	-	-

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INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Electrical insulating materials – Determination of the effects of ionizing radiation –
Part 5: Procedures for assessment of ageing in service**

**Matériaux isolants électriques – Détermination des effets des rayonnements
ionisants –
Partie 5: Procédures pour l'estimation du vieillissement en service**

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CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope and object.....	6
2 Normative references	6
3 Terms and definitions	7
4 Background	7
4.1 General.....	7
4.2 Diffusion limited oxidation (DLO)	7
4.3 Dose rate effects (DRE)	8
4.4 Accelerated radiation ageing	8
4.5 Accelerated thermal ageing	9
5 Approaches to ageing assessment	9
6 Identifying components of concern	9
6.1 General.....	9
6.2 Priorities for ageing management.....	9
6.3 Environmental monitoring	10
6.4 Localized severe environments	10
6.5 Worst case components	10
7 Condition monitoring techniques.....	10
7.1 General.....	10
7.2 Establishing correlation curves for CM methods	11
7.3 CM methods.....	11
7.4 Using CM for short-term troubleshooting.....	11
7.5 Using CM for long-term degradation assessment.....	13
8 Predictive modelling	14
9 Sample deposit.....	15
9.1 General.....	15
9.2 Requirements of a deposit.....	15
9.3 Pre-ageing samples for a deposit	15
9.4 Installation of an sample deposit	15
9.5 Testing of samples from the deposit	16
9.6 Determination of sampling intervals.....	16
9.7 Real time aged materials.....	17
Annex A (informative) Example of a CM correlation curve	18
Annex B (informative) Use of a deposit	19
Bibliography.....	20
Figure 1 – Development of ageing data on changes in tensile elongation and a condition indicator (e.g. indenter modulus) – Schematic.....	12
Figure 2 – Correlation curve derived from data in Figure 1 – Schematic.....	13
Figure 3 – Estimation of elongation from a correlation curve	14
Figure 4 – Modification of sampling interval dependent on values of the CM indicator.....	17
Figure A.1 – Correlation curve for indenter modulus against tensile elongation for a CSPE cable jacket material [18].....	18

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICAL INSULATING MATERIALS –
DETERMINATION OF THE EFFECTS OF IONIZING RADIATION –**

Part 5: Procedures for assessment of ageing in service

FOREWORD

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International Standard IEC 60544-5 has been prepared IEC technical committee TC 112: Evaluation and qualification of electrical insulating materials and systems.

This second edition cancels and replaces the first edition, published in 2003, and constitutes an editorial revision to align it with standards recently developed by SC 45A as well as with other parts in the IEC 60544 series.

The text of this standard is based on the following documents:

CDV	Report on voting
112/171/CDV	112/191/RVC

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60544 series, published under the general title *Electrical insulating materials – Determination of the effects of ionizing radiation*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

Organic and polymeric materials provide a significant proportion of the insulation used in electrical systems. These materials are sensitive to the effects of irradiation and the response varies widely between different types. It is therefore important to be able to assess the degree of degradation of these insulating materials during their service lifetimes. This part of IEC 60544 provides recommended procedures for assessing ageing of insulating materials in service.

There are a number of approaches to the assessment of ageing of polymer-based components exposed to radiation environments [1–4]¹. These are based on the better understanding of the factors affecting ageing degradation which has been developed over several decades. In nuclear power plants, qualification programmes are normally used for selection of components, including those based on polymeric materials. These initial qualification procedures, such as IEEE-323 [5] and IEEE-383 [6], were originally written before there was sufficient understanding of ageing mechanisms. Most of the methods discussed in this part of IEC 60544 are therefore used to supplement the initial qualification process.

This part is the fifth in a series dealing with the effect of ionizing radiation on insulating materials.

Part 1 (Radiation interaction and dosimetry) constitutes an introduction dealing very broadly with the problems involved in evaluating radiation effects. It also provides guidance to dosimetry terminology, several methods of determining exposure and absorbed dose, and methods of calculating absorbed dose in any specific material from the dosimetry method applied.

Part 2 (Procedures for irradiation and test) describes procedures for maintaining seven different types of exposure conditions during irradiation. It also specifies the controls that should be maintained over these conditions so that when test results are reported, reliable comparisons of material performance can be made. In addition, it defines certain important irradiation conditions and test procedures to be used for property change determinations and corresponding end-point criteria.

Part 3 has been incorporated into the second edition of IEC 60544-2.

Part 4 (Classification system for service in radiation environments) provides a recommended classification system for categorizing the radiation endurance of insulation materials.

¹ Figures in square brackets refer to the bibliography.