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Irish Standard I.S. EN 62217:2013

Polymeric HV insulators for indoor and outdoor use - General definitions, test methods and acceptance criteria (IEC 62217:2012 (EQV))

Incorporating amendments/corrigenda issued since publication:

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## EUROPEAN STANDARD

# EN 62217

# NORME EUROPÉENNE EUROPÄISCHE NORM

March 2013

ICS 29.080.10

Supersedes EN 62217:2006

English version

### Polymeric HV insulators for indoor and outdoor use -General definitions, test methods and acceptance criteria (IEC 62217:2012)

Isolateurs polymériques à haute tension pour utilisation à l'intérieur ou à l'extérieur -Définitions générales, méthodes d'essai et critères d'acceptation (CEI 62217:2012) Hochspannungs-Polymerisolatoren für Innenraum- und Freiluftanwendung -Allgemeine Begriffe, Prüfverfahren und Annahmekriterien (IEC 62217:2012)

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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

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EN 62217:2013

#### I.S. EN 62217:2013 - 2 -

#### Foreword

The text of document 36/321/FDIS, future edition 2 of IEC 62217, prepared by IEC TC 36 "Insulators" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62217:2013.

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)	2013-09-08
•	latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2015-11-01

This document supersedes EN 62217:2006.

EN 62217:2013 includes the following significant technical change with respect to EN 62217:2006:

EN 62217:2006 included two other alternative tracking and erosion tests (a 5 000 hour multi-stress test and a tracking wheel test) which were based on tests developed by CIGRE and utilities. These tests are no longer given as normative alternatives following the results of a study/questionnaire by TC 36 on the relative merits of all three tracking and erosion tests. The 5 000 hour multi-stress test and a tracking wheel test are described in IEC/TR 62730:2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

#### **Endorsement notice**

The text of the International Standard IEC 62217:2012 was approved by CENELEC as a European Standard without any modification.

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

ISO 3274

NOTE Harmonized as EN ISO 3274.

I.S. EN 62217:2013 - 3 -

EN 62217:2013

### 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.

Publication	Year	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-471	2007	International Electrotechnical Vocabulary - Part 471: Insulators	-	-
IEC 60060-1	-	High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	-
IEC 60068-2-11	-	Environmental testing - Part 2: Tests - Test Ka: Salt mist	EN 60068-2-11	-
IEC 60507	-	Artificial pollution tests on high-voltage insulators to be used on a.c. systems	EN 60507	-
IEC 60695-11-10	-	Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods	EN 60695-11-10	-
IEC 60721-1	-	Classification of environmental conditions - Part 1: Environmental parameters and their severities	EN 60721-1	-
IEC/TS 60815-1	-	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 1: Definitions, information and general principles	-	-
ISO 868	-	Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)	EN ISO 868	-
ISO 4287	-	Geometrical Product Specifications (GPS) - Surface texture: Profile method - Terms, definitions and surface texture parameters	EN ISO 4287	-
ISO 4892-1	-	Plastics - Methods of exposure to laboratory light sources - Part 1: General guidance	EN ISO 4892-1	-
ISO 4892-2	-	Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps	EN ISO 4892-2	-

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- 2 -

#### 62217 © IEC:2012

## CONTENTS

FOI	REWC	)RD		4
INT	RODU	JCTION	l	6
1	Scop	e and o	bject	7
2	Norm	ative re	ferences	7
3	Term	s and d	efinitions	8
4	Ident	ification		10
5	Envir	onment	al conditions	10
6	Inforr	mation o	on transport, storage and installation	11
7	Class	sificatio	n of tests	11
	7.1	Design	tests	
	7.2	Type te	ests	
	7.3	Sample	e tests	12
	7.4	Routin	e tests	12
8	Gene	ral requ	uirements for insulator test specimens	12
9	Desig	gn tests		13
	9.1	Genera	al	13
	9.2	Tests o	on interfaces and connections of end fittings	13
		9.2.1	General	13
		9.2.2	Test specimens	13
		9.2.3	Reference voltage and temperature for verification tests	13
		9.2.4	Reference dry power frequency test	13
		9.2.5	Product specific pre-stressing	13
		9.2.6	Water immersion pre-stressing	14
	0.0	9.2.7	Verification tests	14
	9.3		bh shed and housing material	15
		9.3.1	Accelerated weathering test	13
		9.3.2	Tracking and erosion test – 1 000 h salt fog test – Procedure	13
		934	Flammability test	
	9.4	Tests o	on the core material	
		9.4.1	Porosity Test (Dye penetration test)	18
		9.4.2	Water diffusion test	19
Anr	nex A agein	(informa ig test c	ative) Difference between the tracking and erosion and accelerated on polymeric insulators	23
Anr	nex B	(informa	ative) Recommended application of tests	24
Anr	nex C	(informa	ative) Explanation of the concept of classes for the design tests	25
Bib	liogra	ohy		26
Fig	ure 1 -	– Exam	ples of test specimen for core material	19
Fia	ure 2 -	– Exam	ple of boiling container for the water diffusion test	20
Fia	ure 3 -	– Electr	odes for the voltage test	21
Fio	ure 4 -	- Voltad	ae test circuit	
. 9			,	

62217 © IEC:2012	- 3 -
Table 1 – Normal environmental conditions	
Table 2 – Initial NaCl content of the water a	s a function of the specimen dimensions17
Table 3 – Flammability requirements	

- 4 -

62217 © IEC:2012

#### INTERNATIONAL ELECTROTECHNICAL COMMISSION

#### POLYMERIC HV INSULATORS FOR INDOOR AND OUTDOOR USE – GENERAL DEFINITIONS, TEST METHODS AND ACCEPTANCE CRITERIA

#### FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committee; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62217 has been prepared by IEC technical committee 36: Insulators.

This second edition cancels and replaces the first edition published in 2005. This edition constitutes a technical revision.

This edition includes a significant technical change with respect to the previous edition.

The first edition of IEC 62217 (2005) included two other alternative tracking and erosion tests (a 5 000 hour multi-stress test and a tracking wheel test) which were based on tests developed by CIGRE and utilities. These tests are no longer given as normative alternatives following the results of a study/questionnaire by TC 36 on the relative merits of all three tracking and erosion tests. The 5 000 hour multi-stress test and a tracking wheel test are described in IEC/TR 62730 (2012).

62217 © IEC:2012

- 5 -

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

FDIS	Report on voting
36/321/FDIS	36/324/RVD

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.

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.

#### INTRODUCTION

- 6 -

Polymeric insulators consist either of one insulating material (resin insulators) or two or several insulating materials (composite insulators). The insulating materials are generally cross-linked organic materials synthesised from carbon or silicon chemistry and form the insulating body. Insulating materials can be composed from organic materials containing various inorganic and organic ingredients, such as fillers and extenders. End fittings are often used at the ends of the insulating body to transmit mechanical loads. Despite these common features, the materials used and the construction details employed by different manufacturers may be widely different.

The tests given in this standard are those which are, in general, common to a great majority of insulator designs and materials, whatever their final application. They have been regrouped in this standard to avoid repetition in the relevant product standards and drift between procedures as the various product standards are drafted or revised.

The majority of these tests have been grouped together as "Design tests", to be performed only once for insulators of the same design. The design tests are intended to eliminate insulator designs, materials or manufacturing technologies which are not suitable for highvoltage applications. The influence of time on the electrical properties of the complete polymeric insulator and its components (core material, housing, interfaces etc.) has been considered in specifying the design tests in order to ensure a satisfactory lifetime under normal operating and environmental conditions.

Pollution tests, according to IEC 60507 or IEC 61245, are not included in this document, the applicability of their methodology to composite insulators not having been proven and still requiring study by CIGRE. The results of such pollution tests performed on insulators made of polymeric materials do not correlate with experience obtained from service. Specific pollution tests for polymeric insulators are still under consideration.

The 1 000 hour salt-fog tracking and erosion test given in this second edition of IEC 62217 is considered as a screening test intended to reject materials or designs which are inadequate. This test is not intended to predict long term performance for insulator designs under cumulative service stresses. For more information, see Annex C. The first edition of IEC 62217 (2005) included two other alternative tracking and erosion tests (a 5 000 hour multi-stress test and a tracking wheel test) which were based on tests developed by CIGRE and utilities. These tests are no longer given as normative alternatives following the results of a study/questionnaire by TC 36 on the relative merits of all three tracking and erosion tests. The 5 000 hour multi-stress test and a tracking wheel test are described in IEC/TR 62730 (2012).

Composite insulators are used in both a.c. and d.c. applications. In spite of this fact a specific tracking and erosion test procedure for d.c. applications as a design test has not yet been defined and accepted. The 1 000 hour a.c. tracking and erosion test described in this standard is used to establish a minimum requirement for the tracking resistance of the housing material.

IEC Guide 111 has been followed wherever possible during the preparation of this standard.

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- 7 -

#### POLYMERIC HV INSULATORS FOR INDOOR AND OUTDOOR USE – GENERAL DEFINITIONS, TEST METHODS AND ACCEPTANCE CRITERIA

#### **1** Scope and object

This International Standard is applicable to polymeric insulators whose insulating body consists of one or various organic materials. Polymeric insulators covered by this standard include both solid core and hollow insulators. They are intended for use on HV overhead lines and in indoor and outdoor equipment.

The object of this standard is

- to define the common terms used for polymeric insulators;
- to prescribe common test methods for design tests on polymeric insulators;
- to prescribe acceptance or failure criteria, if applicable;

These tests, criteria and recommendations are intended to ensure a satisfactory life-time under normal operating and environmental conditions (see Clause 5). This standard shall only be applied in conjunction with the relevant product standard.

#### 2 Normative references

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.

IEC 60050-471:2007, International Electrotechnical Vocabulary – Part 471: Insulators

IEC 60060-1, High-voltage test techniques – Part 1: General definitions and test requirements

IEC 60068-2-11, Environmental testing – Part 2: Tests. Test KA: Salt mist

IEC 60507, Artificial pollution tests on high-voltage insulators to be used on a.c. systems

IEC 60695-11-10, Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods

IEC 60721-1, Classification of environmental conditions – Part 1: Environmental parameters and their severities

IEC 60815-1, Selection and dimensioning of high-voltage insulators intended for use in polluted conditions – Part 1: Definitions, information and general principles

ISO 868, Plastics and ebonite – Determination of indentation hardness by means of a durometer (Shore hardness)



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