



SLOVENSKI STANDARD SIST EN 62231:2007

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Composite station post insulators for substations with a.c. voltages greater than 1 000 V up to 245 kV - Definitions, test methods and acceptance criteria (IEC 62231:2006)

Verbundstützisolatoren für Unterwerke für Wechselspannung größer 1 kV bis 245 kV - Definitionen, Prüfmethode und Annahmekriterien (IEC 62231:2006)

Isolateurs supports composites rigides a socle destinés aux postes a courant alternatif de tensions supérieures a 1 000 V jusqu'a 245 kV - Définitions, méthodes d'essai et criteres d'acceptation (IEC 62231:2006)

Ta slovenski standard je istoveten z: EN 62231:2006

ICS:

29.080.10 Izolatorji Insulators

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SIST EN 62231-2007
This European Standard was approved by CENELEC on 2006-09-12. 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, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the 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 text of document 36C/159/FDIS, future edition 1 of IEC 62231, prepared by SC 36C, Insulators for substations, of IEC TC 36, Insulators, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62231 on 2006-09-12.

This standard is to be used in conjunction with EN 62217:2006, *Polymeric insulators for indoor and outdoor use with a nominal voltage > 1 000 V - General definitions, test methods and acceptance criteria*.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2007-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-10-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62231:2006 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60865	NOTE Harmonized in EN 60865 series (not modified).
IEC 60507	NOTE Harmonized as EN 60507:1993 (not modified).
IEC 61952	NOTE Harmonized as EN 61952:2003 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. 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 60050-471	- ¹⁾	International Electrotechnical Vocabulary (IEV) Chapter 471: Insulators	-	-
IEC 60060-1	- ¹⁾	High-voltage test techniques Part 1: General definitions and test requirements	HD 588.1 S1	1991 ²⁾
IEC 60168	1994	Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1000 V	EN 60168	1994 ²⁾
IEC 62217	- ¹⁾	Polymeric insulators for indoor and outdoor use with a nominal voltage > 1 000 V - General definitions, test methods and acceptance criteria	EN 62217 + corr. December	2006 ²⁾ 2006
ISO 1101	- ¹⁾	Geometrical Product Specifications (GPS) - Geometrical tolerancing - Tolerances of form, orientation, location and run-out	EN ISO 1101	2005 ²⁾
ISO 3452	- ¹⁾	Non-destructive testing - Penetrant inspection - General principles	-	-

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

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destinés aux postes à courant alternatif
de tensions supérieures à 1 000 V jusqu'à 245 kV –
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International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



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Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**COMPOSITE STATION POST INSULATORS FOR SUBSTATIONS
WITH AC VOLTAGES GREATER THAN 1000 V UP TO 245 kV –
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 committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62231 has been prepared by subcommittee 36C: Insulators for substations, of IEC technical committee 36: Insulators.

This bilingual version (2006-04) replaces the English version.

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

FDIS	Report on voting
36C/159/FDIS	36C/160/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.

The French version of this standard has not been voted upon.

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

This standard is to be read in conjunction with IEC 62217:2005, *Polymeric insulators for indoor and outdoor use with a nominal voltage >1 000 V – General definitions, test methods and acceptance criteria*.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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

Composite station post insulators consist of a cylindrical solid insulating core made of resin impregnated fibres, bearing the mechanical load, protected by an elastomer housing, the loads being transmitted to the core by metal fittings. Despite these common features, the materials used and the construction details employed by different manufacturers may be different.

Some tests have been grouped together as "design tests" to be performed only once for insulators of the same design. The design tests are performed in order to eliminate insulator designs, materials and manufacturing technologies not suitable for high-voltage applications. The influence of time on the electrical and mechanical properties of the complete composite station post insulator and its components (core material, housing material, interfaces, etc.) has been considered in specifying the design tests in order to ensure a satisfactory lifetime under normal service conditions.

The approach for mechanical testing under bending loads used in this Standard is based on IEC 61952. This approach uses the concept of a damage limit that is the maximum stress that can be developed in the insulator before damage begins to occur. Work is underway to validate the acoustic emission technique to determine the inception of damage.

In some cases, station post insulators can be subjected to a combination of loads. In order to give some guidance, Annex B explains how to calculate the equivalent bending moment in the insulators resulting from the combination of bending, tensile and compression loads.

Pollution tests, as specified in IEC 60507 and IEC 61245, are not included in this document, their applicability to composite station post insulators having not been proven. Such pollution tests performed on composite insulators do not correlate with experience obtained from service. Specific pollution tests for composite insulators are under consideration.

It has not been considered useful to specify a power arc test as a mandatory test. The test parameters are manifold and can have very different values depending on the configurations of the network and the supports and on the design of arc-protection devices. The heating effect of power arcs should be considered in the design of metal fittings. Critical damage to the metal fittings, resulting from the magnitude and duration of the short-circuit current can be avoided by properly designed arc-protection devices. This standard, however, does not exclude the possibility of a power arc test by agreement between the user and the manufacturer. IEC 61467 gives details of a.c. power arc testing of insulator sets.

Impulse (mechanical) loads in substation are typically caused by short-circuits. Post insulators are affected by forces due to the interaction of the currents circulating in conductors/busbars supported by insulators.

The impulse load or peak load may be evaluated using guidance found in the IEC 60865 series.

Work is in progress in CIGRE ESCC (Effects of Short-Circuit Currents) task force to review impulse loads caused by short-circuit currents in substations. The aim of this work is to introduce a new concept: the ESL factor (Equivalent Static Load factor) which is frequency dependent. The actual peak load may be replaced, in a first approximation, by the peak load times the ESL factor. This new value may be used as the MDCL in this document for the determination of the cantilever strength.

Radio interference and corona tests are not specified in this standard since the radio interference and corona performances are not characteristics of the insulator alone.

Composite hollow core station post insulators are currently not dealt with in this standard. IEC 61462 gives details of tests on hollow core composite insulators, many of which can be applied to such station post insulators.

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