SLOVENSKI STANDARD
oSIST prEN IEC 62772:2022

01-junij-2022

Votli podporni kompozitni izolatorji za postaje z izmenično napetostjo, višjo od 1000 V, in enosmerno napetostjo, višjo od 1500 V - Definicije, preskusne metode in merila sprejemljivosti

Composite hollow core station post insulators for substations with a.c. voltage greater than 1 000 V and d.c. voltage greater than 1 500 V - Definitions, test methods and acceptance criteria

Isolateurs supports composites creux pour postes présentant une tension alternative supérieure à 1 000 V et une tension continue supérieure à 1 500 V - Définitions, méthodes d'essai et critères d'acceptation

Ta slovenski standard je istoveten z: **prEN IEC 62772:2022**

ICS:

29.080.10	Izolatorji	Insulators

oSIST prEN IEC 62772:2022 **en,fr,de**

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IEC TC 36 : INSULATORS	
SECRETARIAT: Sweden	SECRETARY: Mr Dan Windmar
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☒ QUALITY ASSURANCE ☐ SAFETY	
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TITLE:

Composite hollow core station post insulators for substations with a.c. voltage greater than 1 000 V and d.c. voltage greater than 1 500 V - Definitions, test methods and acceptance criteria

PROPOSED STABILITY DATE: 2026

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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COMPOSITE HOLLOW CORE STATION POST INSULATORS WITH A.C. VOLTAGE GREATER THAN 1 000 V AND D.C. VOLTAGE GREATER THAN 1 500 V – DEFINITIONS, TEST METHODS AND ACCEPTANCE CRITERIA

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International Standard IEC 62772 has been prepared by IEC technical committee 36: Insulators.

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

FDIS	Report on voting
To be completed/FDIS	To be completed/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.

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

124 • reconfirmed,
125 • withdrawn,
126 • replaced by a revised edition, or amended.

127

INTRODUCTION

Composite hollow core station post insulators consist of an insulating hollow core (tube), bearing the mechanical load protected by a polymeric housing, the load being transmitted to the core by end fittings. The hollow core is filled entirely with an insulating material. The core is made of resin impregnated fibres.

Composite hollow core station post insulators are typically applied as post insulators in substations. In order to perform the design tests, IEC 62217 is to be applied for materials and interfaces of the insulator. Some tests have been grouped together as "design tests", to be performed only once on insulators which satisfy the same design conditions. For all design tests on composite hollow core station post insulators, the common clauses defined in IEC 62217 are applied. As far as practical, the influence of time on the electrical and mechanical properties of the components (core material, housing, interfaces etc.) and of the complete composite hollow core station post insulator has been considered in specifying the design tests to ensure a satisfactory life-time under normally known stress conditions in service.

This standard relates to IEC 61462, *Composite hollow insulators – Pressurized and unpressurized insulators for use in electrical equipment with rated voltage greater than 1 000 V – Definitions, test methods, acceptance criteria and design recommendations*, as well as IEC 62231, *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*. Tests and requirements described in IEC 62231 can be used despite the intended operating voltage limit for substations.

The use of polymeric housing materials that show hydrophobicity and hydrophobicity transfer mechanism (HTM) is preferred for composite hollow core station post insulators. This is due to the fact that the influence of diameter can be significant for hydrophilic surfaces (see also IEC 60815-3). For instance silicone rubber is recognized as successful countermeasure against severe polluted service conditions. For the time being, the 1 000 h a.c. tracking and erosion test of IEC 62217 is used to establish a minimum requirement for the tracking and erosion resistance, for both a.c. and d.c. In IEC 62217 tests are defined to quantify the HTM performance.

Composite hollow core station post insulators are used in both a.c. and d.c. applications. Before the appropriate standard for d.c. applications will be issued, the majority of tests listed in this standard can also be applied to d.c. insulators. In spite of this, a specific tracking and erosion test procedure for d.c. applications as a design test is still being considered to be developed. Some information about the difference of a.c. and d.c. material erosion test can be found in the CIGRE Technical Brochure 611 [REF]. For the time being, the 1 000 h a.c. tracking and erosion test of IEC 62217 is used to establish a minimum requirement for the tracking and erosion resistance.

COMPOSITE HOLLOW CORE STATION POST INSULATORS WITH A.C. VOLTAGE GREATER THAN 1 000 V AND D.C. VOLTAGE GREATER THAN 1 500 V – DEFINITIONS, TEST METHODS AND ACCEPTANCE CRITERIA

1 Scope

This International Standard applies to composite hollow core station post insulators consisting of a load-bearing insulating tube (core) made of resin impregnated fibres, insulating filler material (solid, liquid, gaseous – pressurized or unpressurized), a housing (outside the insulating tube) made of polymeric material (for example silicone or ethylene-propylene) and fixing devices at the ends of the insulating tube. Composite hollow core station post insulators as defined in this standard are intended for general use in substations in both, outdoor and indoor environments, operating with a rated AC voltage greater than 1 000 V a.c. and a frequency not greater than 100 Hz or for use in direct current systems with a rated voltage greater than 1 500 V.d.c.

The object of this standard is:

to define the terms used;

to prescribe test methods;

to prescribe acceptance criteria.

All the tests in this standard, apart from the thermal-mechanical test, are performed at normal ambient temperature. This standard does not prescribe tests that are characteristic of the apparatus of which the composite hollow core station post insulator ultimately may form a part (e.g. disconnector switch, reactor support, HVDC valves).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

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

IEC 60168, *Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1 000 V*

IEC 61109, *Insulators for overhead lines – Composite suspension and tension insulators for a.c. systems with a nominal voltage greater than 1 000 V – Definitions, test methods and acceptance criteria*

IEC 61462, *Composite hollow insulators – Pressurized and unpressurized insulators for use in electrical equipment with rated voltage greater than 1 000 V – Definitions, test methods, acceptance criteria and design recommendations*

IEC 62217, *Polymeric HV insulators for indoor and outdoor use – General definitions, test methods and acceptance criteria*

IEC 62231, Composite station post insulators for substations with a.c. voltages greater than1 000 V up to 245 kV – Definitions, test methods and acceptance criteria

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
composite hollow core station post insulator
post insulator, consisting of at least three insulating parts, namely a tube, a housing with or without sheds, and an internal filler. End fittings are attached to the insulating tube. The housing with or without sheds, may be omitted in case of specific environmental conditions (e.g. indoor).and applications .

Note 1 to entry: A hollow insulator can be made from one or more permanently assembled insulating elements

[IEV 471-01-08, modified]

3.2
post insulator

insulator intended to give rigid support to a live part which is to be insulated from earth or from another live part

Note 1 to entry: A post insulator may be an assembly of a number of post insulator units (stack).

Note 2 to entry: Post insulators for substations are also known as station post insulators.

[IEV 471-04-01, modified]

3.3

tube (core)

central internal insulating part of a composite hollow core station post insulator which provides the mechanical characteristics

Note 1 to entry: The housing, insulating filler material and sheds are not part of the core.

Note 2 to entry: Resin impregnated fibres are structured in such a manner as to achieve sufficient mechanical strength. Layers of different fibres may be used to fulfil special requirements.

3.4
filler
insulating material filling the entire internal space (solid, liquid, gaseous – pressurized or unpressurized) of the hollow core station post insulator

3.5
fixing device (end fitting)
integral component or formed part of an insulator intended to connect it to a supporting structure, or to a conductor, or to an item of equipment, or to another insulator

Note 1 to entry: Where the end fitting is metallic, the term “metal fitting” is normally used.

[SOURCE: IEC 60050-471:2007, 471-01-06, modified by the addition of a synonym]

3.6
coupling
part of the end fitting which transmits the load to the accessories external to the insulator

[SOURCE: IEC 62217, section 3]

3.7
connection zone
zone where the mechanical load is transmitted between the insulating body and the end fitting

[SOURCE: IEC 62217, section 3]

3.8
housing
external insulating part of composite hollow core station post insulator providing necessary creepage distance and protecting the tube from the environment

Note 1 to entry: If an intermediate sheath is used it forms a part of the housing

[SOURCE: IEC 62217, section 3]

3.9
shed
insulating part, projecting from the insulator trunk, intended to increase the creepage distance

Note 1 to entry: The shed can be with or without ribs

[SOURCE: IEC 60050-471:2007, 471-01-15]

3.10
insulator trunk
central insulating part of an insulator from which the sheds project

Note 1 to entry: Also known as shank on smaller insulators.

[SOURCE: IEC 60050-471:2007, 471-01-11]

3.11
creepage distance
shortest distance or the sum of the shortest distances along the surface of an insulator between two conductive parts which normally have the operating voltage between them

Note 1 to entry: The surface of any non-insulating jointing material is not considered as forming part of the creepage distance.

[SOURCE: IEC 60050-471:2007, 471-01-04, modified]

3.12
arcing distance
shortest distance in the air external to the insulator between the metallic parts which normally have the operating voltage between them

[SOURCE: IEC 60050-471:2007, 471-01-01]

3.13
interface
contact surface between the different materials

Note 1 to entry: Various interfaces occur in most composite insulators (cf. Annex C), e.g.

between housing and end fittings,

between various parts of the housing; e.g. between sheds, or between sheath and sheds,

between tube and housing

between tube and filler.

[SOURCE: IEC 62217, section 3]

3.14
damage limit of the tube under mechanical stress
limit below which mechanical loads can be applied, at normal ambient temperature, without micro damage to the composite tube

Note 1 to entry: Applying such loads means that the tube is in a reversible elastic phase. If the damage limit of the tube is exceeded, the tube is in an irreversible plastic phase, which means permanent damage to the tube which may not be visible at a macroscopic level (for a quantitative definition see Annex C of IEC 61462 ED2).

3.15
maximum mechanical load
MML
highest cantilever bending load which is expected to be applied to the composite hollow core station post insulators in accordance with IEC 61462

Note 1 to entry: The MML of the composite hollow core station post insulator is specified by the insulator manufacturer.

3.16
specified mechanical load
SML
cantilever bending load specified by the manufacturer that is used in the mechanical tests, and which is verified during a type test at normal ambient temperature

Note 1 to entry: The SML forms the basis of the selection of composite hollow station post insulators with regard to external loads.

3.17
specified cantilever load
SCL
cantilever load to be withstood by the insulator when tested under the prescribed conditions in accordance with IEC 62231

3.18
maximum design cantilever load
MDCL
load level above which damage to the insulator begins to occur and that should not be exceeded in service in accordance with IEC 62231.

Note to entry: For more information to load philosopies and relationships, see Annex B

3.19
specified torsion load
SToL
torsion load level which can be withstood by the insulator when tested under the prescribed conditions in accordance with IEC 62231

3.20
maximum design torsion load
MDToL
load level above which damage to the insulator begins to occur and that should not be exceeded in service in accordance with IEC 62231

3.21
specified tension load
STL
tension load which can be withstood by the insulator when tested under the prescribed conditions in accordance with IEC 62231