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Characteristics of hollow pressurised and unpressurised ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1000 V

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62371, which is a technical specification, has been prepared by subcommittee 36C: Insulators for substations, of IEC technical committee 36: Insulators.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
36C/172/DTS	36C/173/RVC

Full information on the voting for the approval of this technical specification 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 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

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

The IEC standards concerning insulators for overhead lines and substations are classified into two categories. One is the standard for test methods and acceptance criteria and the other is the product standard in which characteristics of the insulators are specified. Product standards of most insulators, for example cap and pin type, long rod type insulators for overhead lines and station post insulators for substations, are available.

In the case of hollow insulators, test methods and acceptance criteria are standardized in IEC 62155: *Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V*, but there has been no product standard. This seems due to the difference in application among hollow insulators and other insulators. The hollow insulators are usually applied as a component of electrical equipment and other insulators such as cap and pin type or station post insulators are directly applied to the power system as equipment.

There are benefits for standardization of the hollow insulators, even if they are used as components, for insulator manufacturers, equipment manufacturers and final users for the equipment. That is, benefits of cost saving in respect of manufacturing and inventory control, short delivery, interchangeability, etc.

Taking account of every aspect on standardization of the hollow insulators, such as the fact that there are so many designs of electrical equipment, this Technical Specification covers only basic hollow insulators for normal application as a first step towards standardization work. Accordingly, special types of hollow insulators such as barrel type for some circuit-breakers, insulators for pollution and/or seismic areas, etc. are not within the scope of this specification.

Therefore, different hollow insulators not included in this specification can also be applied to the electrical equipment in the case where special characteristics are required, depending on environmental and/or system conditions. There may be the possibility to standardize those hollow insulators as a next step after gathering sufficient information on experiences.

In addition, it should be noted that the characteristics specified here are determined, considering the data collected through the survey on the presently available hollow insulators. There may be the possibility that the survey is not complete and then the hollow insulators not covered by this technical specification can also be applied. Such insulators as widely applied but not covered by this technical specification will be added in the next revision through ascertained experiences.

CHARACTERISTICS OF HOLLOW PRESSURISED AND UNPRESSURISED CERAMIC AND GLASS INSULATORS FOR USE IN ELECTRICAL EQUIPMENT WITH RATED VOLTAGES GREATER THAN 1000 V

1 Scope

This Technical Specification applies to

– ceramic and glass hollow insulators intended for general use in electrical equipment;
– ceramic hollow insulators intended for use with a permanent gas pressure in switchgear and controlgear.

They are intended for indoor and outdoor use in electrical equipment, operating on alternating current with a rated voltage greater than 1 000 V and a frequency not greater than 100 Hz or for use in direct current equipment with a rated voltage greater than 1 500 V.

This specification specifies the dimensional and mechanical characteristics of the hollow insulator, which are essential for interchangeability of the hollow insulator of the same type. It is not the object of this specification to prescribe electrical characteristics because they are dependent on the apparatus of which the hollow insulator ultimately forms a part. However, standard lightning impulse withstand voltage which is provided in IEC 60071-1 is described only for reference for classification purpose.

This specification applies to hollow insulators for use in electrical equipment in clean areas or lightly polluted areas, where seismic qualification is not required. For use in areas characterised by heavy pollution levels and for other particular or extreme environmental conditions such as seismic force, it may be necessary for certain dimensions to be changed.

The hollow insulators covered by this specification are:

a) straight type hollow insulators with metal fittings on both ends;
b) taper type hollow insulators with metal fittings on both ends;
c) straight type hollow insulators without metal fittings;
d) taper type hollow insulators without metal fittings.

The hollow insulators are intended for use in electrical equipment, for example:

– circuit-breakers;
– instrument transformers;
– surge arresters;
– bushings;
– cable sealing ends;
– switch-disconnectors;
– disconnectors;
– earthing switches;
– capacitors.

There may be some cases that hollow insulators whose design can strongly be influenced by other components of specific equipment, for example, active parts of circuit-breakers. For such cases, the hollow insulators can be separately designed, depending on respective requirements of such equipment and not be covered by this specification.

NOTE 1 Hollow insulators not prescribed in this specification can also be applied to electrical equipment, depending on specific requirements of the equipment. However, if similar insulators are available in this specification, it is preferable to apply them.

NOTE 2 For general recommendations for design and tests of the hollow insulators, see IEC 62155.

NOTE 3 For characteristics of hollow insulators for use in polluted areas, reference can be made to IEC 60815-1and IEC 60815-2.

2 Normative references

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.

IEC 62155, *Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1000 V*