SVENSK STANDARD

SS-EN IEC 61462, utg 2:2024

Fastställd	Sida	Ansvarig kommitté
2024-05-22	1 (53)	SEK TK 36

Isolatorer – Trycksatta och icke trycksatta ihåliga isolatorer av kompositmaterial för elektrisk utrustning med märkspänning över 1000 V AC eller 1500 V DC – Definitioner, provningsmetoder och villkor för godkännande

Composite hollow insulators –
Pressurized and unpressurized insulators for use in electrical equipment with AC rated voltage greater than 1 000 V and DC voltage greater than 1 500 V –
Definitions, test methods, acceptance criteria and design recommendations

Som svensk standard gäller europastandarden EN IEC 61462:2023. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 61462:2023.

Nationellt förord

Europastandarden EN IEC 61462:2023

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61462, Second edition, 2023 - Composite hollow insulators – Pressurized and unpressurized insulators for use in electrical equipment with AC rated voltage greater than 1 000 V and DC voltage greater than 1 500 V – Definitions, test methods, acceptance criteria and design recommendations**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61462, utg 1:2008 med eventuella tillägg, ändringar och rättelser gäller ej fr o m 2026-10-11.

ICS 29.080.10

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Telefon: 08 - 444 14 00.
E-post: sek@elstandard.se. Internet: www.elstandard.se

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SEK Svensk Elstandard
Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61462

October 2023

ICS 29.080.10

Supersedes EN 61462:2007

English Version

Composite hollow insulators - Pressurized and unpressurized insulators for use in electrical equipment with AC rated voltage greater than 1 000 V AC and D.C. voltage greater than 1500V - Definitions, test methods, acceptance criteria and design recommendations (IEC 61462:2023)

Isolateurs composites creux - Isolateurs avec ou sans pression interne pour utilisation dans des appareillages électriques de tensions alternatives assignées supérieures à 1 000 V et de tensions continues supérieures à 1 500 V - Définitions, méthodes d'essai, critères d'acceptation et recommandations de conception (IEC 61462:2023)

Verbundhohlisolatoren - Druckbeanspruchte und drucklose Isolatoren für den Einsatz in elektrischen Betriebsmitteln mit einer Bemessungsspannung über 1 000 V AC und 1 500 V DC - Begriffe, Prüfverfahren, Annahmekriterien und Konstruktionsempfehlungen (IEC 61462:2023)

This European Standard was approved by CENELEC on 2023-10-11. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 61462:2023 E

SEK Svensk Elstandard

SS-EN IEC 61462, utg 2:2024

European foreword

The text of document 36/567/FDIS, future edition 2 of IEC 61462, prepared by IEC/TC 36 "Insulators" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61462:2023.

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)	2024-07-11
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2026-10-11

This document supersedes EN 61462:2007 and all of its amendments and corrigenda (if any).

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

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 61462:2023 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 standard indicated:

IEC 60060-1	NOTE Approved as EN 60060-1
IEC 60507	NOTE Approved as EN 60507
IEC 62271-1	NOTE Approved as EN 62271-1
IEC 62271-100	NOTE Approved as EN IEC 62271-100
IEC 60068-2-17	NOTE Approved as EN IEC 60068-2-17
IEC 60168	NOTE Approved as EN 60168
ISO 1101	NOTE Approved as EN ISO 1101
ISO 11357-2:2020	NOTE Approved as EN ISO 11357-2:2020 (not modified)

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 62155	-	Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V	EN 62155	-
IEC 62217	-	Polymeric HV insulators for indoor and outdoor use - General definitions, test methods and acceptance criteria	EN 62217	-
IEC/TR 62039	-	Selection guide for polymeric materials for outdoor use under HV stress	-	-

IEC 61462

Edition 2.0 2023-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Composite hollow insulators – Pressurized and unpressurized insulators for use in electrical equipment with AC rated voltage greater than 1 000 V AC and D.C. voltage greater than 1500V – Definitions, test methods, acceptance criteria and design recommendations

Isolateurs composites creux – Isolateurs avec ou sans pression interne pour utilisation dans des appareillages électriques de tensions alternatives assignées supérieures à 1 000 V et de tensions continues supérieures à 1 500 V – Définitions, méthodes d'essai, critères d'acceptation et recommandations de conception

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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COMPOSITE HOLLOW INSULATORS – PRESSURIZED AND UNPRESSURIZED INSULATORS FOR USE IN ELECTRICAL EQUIPMENT WITH AC RATED VOLTAGE GREATER THAN 1 000 V AND DC VOLTAGE GREATER THAN 1 500 V – DEFINITIONS, TEST METHODS, ACCEPTANCE CRITERIA AND DESIGN RECOMMENDATIONS

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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IEC 61462 has been prepared by IEC technical committee 36: Insulators. It is an International Standard.

This new edition cancels and replaces the previous edition published in 2007. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) modifications of terms and definitions;
b) modifications of tests procedures included in IEC TR 62039 and IEC 62217 (Hydrophobicity transfer test; Water diffusion test on the core with housing);
c) modification of Clause 8 (type tests) to reflect common practice and to also consider tapered (conical) insulators;

d) modification of order of the stages of mechanical sample test (9.4) by setting the tightness test as last stage;

e) harmonization of Table 3 (Tests to be carried out after design changes) with other product standards;

f) addition of a new informative Annex D: Principle sketch of hollow insulators design assembly;

g) addition of a new informative Annex E: Type tests on tapered (conical) insulators.

The text of this International Standard is based on the following documents:

Draft	Report on voting
36/567/FDIS	36/586/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

INTRODUCTION

Composite hollow insulators consist of an insulating tube bearing the mechanical load protected by an elastomeric housing, the loads being transmitted to the tube by metal fittings. Despite these common features, the materials used and the construction details employed by different manufacturers may vary.

Some tests have been grouped together as "Design tests" to be performed only once for insulators of the same design and material. The design tests are performed in order to eliminate designs and materials not suitable for high-voltage applications.

The relevant design tests defined in IEC 62217 are applied for composite hollow insulators; additional specific mechanical tests are given in this document. The influence of time on the electrical and mechanical properties of the complete composite hollow insulator and its components (tube material, housing material, interfaces, etc.) has been considered in specifying the design tests in order to ensure a satisfactory lifetime under normal service conditions. These conditions may also depend on the equipment inside or outside the composite hollow insulators; however, this matter has not been covered in this document. It is possible for test methods not specified in this document to be considered for specific combinations of materials and specific applications, and are a matter of agreement between manufacturers and users. In this document, the term "user" in general means the equipment manufacturer using composite hollow insulators.

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

This document distinguishes between design tests and type tests because several general characteristics of a specific design and specific combinations of materials do not vary for different insulator types. In these cases results from design tests can be adopted for different insulator types.

Pollution tests according to IEC 60507 or IEC 61245 are not included in this document since they are designed for non-polymeric items. Specific pollution tests for polymeric insulators are still under consideration.

The mechanical characteristics of composite hollow insulators are quite different compared to those of hollow insulators made of ceramics. In order to determine the onset of mechanical deterioration of composite hollow insulators under the influence of mechanical stress, strain gauge measurements are used.

This document refers to different characteristic pressures which are used for design and testing of composite hollow insulators. The term "maximum service pressure" (MSP) is equivalent to the term "design pressure" which is used in other standards for ceramic hollow insulators; however, this latter term is not used in this standard in order to avoid confusion with "design" as used in "design tests".

General recommendations for the design and construction of composite hollow insulators are presented in Annex B.

COMPOSITE HOLLOW INSULATORS – PRESSURIZED AND UNPRESSURIZED INSULATORS FOR USE IN ELECTRICAL EQUIPMENT WITH AC RATED VOLTAGE GREATER THAN 1 000 V AND DC VOLTAGE GREATER THAN 1 500 V – DEFINITIONS, TEST METHODS, ACCEPTANCE CRITERIA AND DESIGN RECOMMENDATIONS

1 Scope

This document, which is an International Standard, applies to composite hollow insulators consisting of a load-bearing insulating tube made of resin impregnated fibres, a housing (outside the insulating tube) made of elastomeric material (for example silicone or ethylene-propylene) and metal fixing devices at the ends of the insulating tube (see Figure D.1 and Figure D.2 for examples). Composite hollow insulators as defined in this document are intended for general use (unpressurized) or for use with a permanent gas pressure (pressurized). They are intended for use in both outdoor and indoor electrical equipment operating on alternating current with a rated voltage greater than 1 000 V AC and a frequency not greater than 100 Hz or for use in direct current equipment with a rated voltage greater than 1 500 V DC.

The object of this document is:

– to define the terms used;
– to specify test methods;
– to specify acceptance criteria.

Hollow insulators are integrated into electrical equipment which is electrically type tested as required by the applicable equipment standard. So, it is not the object of this document to specify dielectric type tests because the withstand voltages and flashover behaviour are not characteristics of the hollow insulator itself but of the apparatus of which it ultimately forms a part.

All the tests in this document, apart from the thermal-mechanical test, are performed at normal ambient temperature. This document does not specify tests that might be characteristic of the equipment of which the hollow insulator ultimately forms a part.

Composite hollow insulators are intended for use in electrical equipment, such as, but not limited to:

- HV circuit-breakers,
- switch-disconnectors,
- disconnectors,
- station posts,
- disconnecting circuit breakers,
- earthing switches,
- instrument- and power transformers,
- bushings,
- housing for surge arresters,
- cable terminations.

Additional testing defined by the relevant IEC equipment standard may be required.

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 62155, *Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V*

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

IEC TR 62039, *Selection guidelines for polymeric materials for outdoor use under HV stress*