IEC 60383-1

Edition 5.0 2023-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Insulators for overhead lines with a nominal voltage above 1000 V – Part 1: Ceramic or glass insulator units for a.c. systems – Definitions, test methods and acceptance criteria

Isolateurs pour lignes aériennes de tension nominale supérieure à 1 000 V – Partie 1: Éléments d'isolateurs en matière céramique ou en verre pour systèmes à courant alternatif – Définitions, méthodes d'essai et critères d'acceptation



IEC 60383-1:2023-07(en-fr)



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2023 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, …). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org
Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 300 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 19 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

IEC 60383-1

Edition 5.0 2023-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Insulators for overhead lines with a nominal voltage above 1000 V – Part 1: Ceramic or glass insulator units for a.c. systems – Definitions, test methods and acceptance criteria

Isolateurs pour lignes aériennes de tension nominale supérieure à 1 000 V – Partie 1: Éléments d'isolateurs en matière céramique ou en verre pour systèmes à courant alternatif – Définitions, méthodes d'essai et critères d'acceptation

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 29.080.10, 29.240.20

ISBN 978-2-8322-7128-5

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

® Registered trademark of the International Electrotechnical Commission
Marque déposée de la Commission Electrotechnique Internationale

CONTENTS

FOREWORD 6
INTRODUCTION 8
1 Scope 9
2 Normative references 9
3 Terms and definitions 10
4 Classification, types of insulators and insulating materials 13
4.1 Insulator classes 13
4.2 Insulator types 14
4.3 Insulating materials 14
5 Identification of insulators 14
6 Classification of tests 14
6.1 Type tests 14
6.2 Sample tests 15
6.3 Routine tests 15
7 Cross-reference tables for tests to be performed 15
7.1 Pin insulators 15
7.2 Line post insulators 17
7.3 String insulator units 19
7.3.1 General 19
7.3.2 Specified type tests on string insulator units 20
7.4 Insulators for overhead electric traction lines 24
8 Procedures for type and sample tests 24
8.1 Insulator selection for type tests 24
8.2 Sampling rules and procedures for sample tests 24
8.3 Re-test procedure for sample tests 25
9 General requirements for electrical tests 25
10 Artificial rain parameters for wet tests 26
11 Mounting arrangements for electrical tests 26
12 Dry lightning impulse voltage tests 26
12.1 General 26
12.2 Test procedure 26
12.3 Acceptance criteria 26
13 Wet power frequency withstand voltage tests 27
13.1 Test procedure 27
13.2 Acceptance criteria 27
14 RIV test 27
14.1 Test procedure 27
14.2 Acceptance criteria 28
15 Puncture withstand test 28
15.1 General 28
15.2 Impulse puncture testing in air 28
15.3 Power frequency puncture withstand test 29
16 Routine electrical test 29
17 Verification of the dimensions 30
18 Electromechanical failing load test 30

18.1 Test procedure 30
18.2 Acceptance criteria 31
19 Mechanical failing load test 31
19.1 Test procedure for pin and line post insulators 31
19.2 Test procedure for string insulator units 31
19.3 Acceptance criteria for pin insulators 31
19.4 Acceptance criteria for string insulator units and line post insulators 31
20 Thermal-mechanical performance test 32
20.1 Test procedure 32
20.2 Acceptance criteria 33
21 Residual strength test 33
21.1 General 33
21.2 Previous tests 33
21.3 Preparation of the test pieces 33
21.4 Test procedure 34
21.5 Test results 34
21.6 Acceptance criteria 34
22 Verification of the axial, radial and angular displacements 34
22.1 Test procedure 34
22.2 Acceptance criteria 35
23 Verification of the locking system 36
23.1 General 36
23.2 Conformity of the locking device 36
23.3 Verification of locking 36
23.4 Position of the locking device 36
23.5 Procedure for the operation test 36
23.6 Acceptance criteria for the operation test 37
24 Temperature cycle test 37
24.1 Test procedure for ceramic or toughened glass material 37
24.2 Test procedure for of annealed glass 38
24.3 Special test procedure for insulators with thick sections or very large insulators 38
24.4 Complementary specifications 38
24.5 Acceptance criteria 38
25 Thermal shock test 39
25.1 Sample test 39
25.1.1 Test procedure 39
25.1.2 Acceptance criteria 39
25.2 Routine thermal shock test 39
25.2.1 Test procedure 39
25.2.2 Acceptance criteria 39
26 Porosity test 39
26.1 Test procedure 39
26.2 Acceptance criteria 39
27 Galvanizing test 40
27.1 General 40
27.2 Test procedure 40
27.2.1 General 40

27.2.2 Appearance 40
27.2.3 Determination of the coating mass by the magnetic test method 40
27.3 Acceptance criteria 40
27.3.1 Acceptance criteria for the appearance test 40
27.3.2 Acceptance criteria for the value of coating mass 41
28 Zinc sleeve test (if applicable) 41
28.1 General requirements concerning the zinc sleeve 41
28.2 Type test procedure 41
28.3 Sample test procedure 42
29 Routine visual inspection 42
29.1 General 42
29.2 Insulators with ceramic insulating parts 42
29.3 Insulators with glass insulating parts 43
30 Impact test 44
30.1 Test procedure 44
30.2 Acceptance criteria 44
31 Routine mechanical test 44
31.1 Routine mechanical test on line post insulators 44
31.2 Routine mechanical test on string insulator units 45
32 Mounting arrangements for tests on pin insulators 45
32.1 Standard mounting arrangement for electrical tests 45
32.2 Mounting arrangements for electrical tests reproducing service conditions 46
32.3 Mounting arrangement for the mechanical failing load test 46
33 Coefficients for statistical analysis of the test results on line post Insulators 46
33.1 Coefficient for type tests 46
33.2 Coefficients for sample tests 46
34 Mounting arrangements for tests on line post insulators 46
34.1 Standard mounting arrangement for electrical tests 46
34.2 Mounting arrangements for electrical tests reproducing service conditions 47
34.3 Mounting arrangement for the mechanical failing load test 47
35 Coefficients for statistical analysis of the test results on string insulator units 47
35.1 Coefficient for type tests 47
35.2 Coefficients for sample tests 48
36 Mounting arrangements for electrical tests on string insulator units 48
37 Mounting arrangements for electrical tests on Insulators for overhead electric traction lines 48
37.1 Standard mounting arrangement 48
37.2 Mounting arrangement representing service conditions 49
Annex A (informative) Method of comparison of the results of electromechanical or mechanical type and sample tests 52
Annex B (informative) Illustration of the mechanical and electromechanical test acceptance procedure for string insulator units and line post insulators 54
B.1 Flow charts 54
B.2 Calculated examples of acceptance and rejection 56
Annex C (informative) Coatings on ceramic or glass insulators 59
C.1 General 59
C.2 Material fingerprinting and ageing performance 59
C.3 Type testing 59

C.4 Sample testing 60
C.5 Routine testing 60
C.6 Pollution performance 60
C.7 Acceptance criteria 60
Annex D (informative) Impact test 62

Figure 1 – Schematic representation of the thermal-mechanical performance test 49
Figure 2 – Measurement of axial and radial displacements 50
Figure 3 – Measurement of angular displacement 50
Figure 4 – Greatest thickness of the insulator 51
Figure B.1 – Acceptance flow chart for mechanical or electromechanical type tests 54
Figure B.2 – Acceptance flow chart for mechanical or electromechanical sample tests 55
Figure B.3 – Flow chart of the comparison of type and sample tests 56
Figure C.1 – Example of thickness criteria based on current experience 60
Figure C.2 – Example of adherence test criteria 61
Figure D.1 – Example of equipment for impact testing 62

Table 1 – Cross-reference table for pin insulators 17
Table 2 – Cross-reference table for line post insulators 19
Table 3 – Cross-reference table for string insulator units – cap and pin 21
Table 4 – Cross-reference table for string insulator units – long rod 23
Table 5 – Sample sizes for sample tests 25
Table 6 – Acceptance criteria for impact test 44
Table 7 – Coefficients for sample tests (line post insulators) 46
Table 8 – Coefficients for sample tests (string insulator units) 48
Table A.1 – Values for constants a, b and c 52
Table A.2 – Values for constants a, b and c (re-test) 53
Table B.1 – Examples for mechanical and electromechanical sample tests 57
Table B.2 – Blank form for calculation for mechanical and electromechanical sample tests 58

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

INSULATORS FOR OVERHEAD LINES WITH A NOMINAL VOLTAGE ABOVE 1 000 V –

Part 1: Ceramic or glass insulator units for AC systems – 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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60383 has been prepared by IEC technical committee 36: Insulators. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 1993. This edition constitutes a technical revision.

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

a) The complete document has been revised and updated. The layout of the document has been changed in order to increase readability;
b) RIV test has been added (Clause 14);
c) Impulse puncture test in air has been added (15.2);
d) Residual strength test has been added (Clause 21);

e) Zinc sleeve test has been added (Clause 28);

f) Impact test has been added (Clause 30);

g) Annex C, coatings on ceramic and glass insulators has been added;

h) Annex D, impact test has been added.

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

Draft	Report on voting
36/564/FDIS	36/571/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.

A list of all parts in the IEC 60383 series, published under the general title *Insulators for overhead lines with a nominal voltage above 1 000 V*, can be found on the IEC website.

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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 60383 deals with four different types of insulators:

- Pin insulators
- Line post insulators
- String insulator units
- Insulators for overhead electric traction lines

Certain clauses of this document contain general requirements and other clauses contain specific tests relevant to each of the above-mentioned insulators.

INSULATORS FOR OVERHEAD LINES WITH A NOMINAL VOLTAGE ABOVE 1 000 V –

Part 1: Ceramic or glass insulator units for AC systems – Definitions, test methods and acceptance criteria

1 Scope

This part of IEC 60383 applies to insulators of ceramic material or glass for use on AC overhead power lines and overhead traction lines with a nominal voltage greater than 1 000 V and a frequency not greater than 100 Hz. It also applies to insulators for use on DC overhead electric traction lines.

This document applies to string insulator units, rigid overhead line insulators and to insulators of similar design when used in substations.

It does not apply to insulators forming parts of electrical apparatus or to parts used in their construction or to post insulators which are covered by IEC 60168, *Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1 000 V*.

Tests on insulator strings and insulator sets (for example, wet switching impulse voltage) are dealt with in IEC 60383-2.

The object of this document is:

– to define the terms used
– to define insulator characteristics and to prescribe the conditions under which the specified values of these characteristics shall be verified
– to prescribe test methods
– to prescribe acceptance criteria.

This document does not include requirements dealing with the choice of insulators for specific operating conditions.

Specific requirements on the use of coatings on ceramic or glass insulators are described in the informative Annex C.

Numerical values for insulator characteristics are specified in IEC 60305, IEC 60433 and IEC 60720.

NOTE A guide for the choice of insulators under polluted conditions has been published, see IEC 60815-1 and -2.

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 60120, *Ball and socket couplings of string insulator units – Dimensions*

IEC 60305, *Insulators for overhead lines with a nominal voltage above 1000 V – Ceramic or glass insulator units for AC systems – Characteristics of insulator units of the cap and pin type*

IEC 60372, *Locking devices for ball and socket couplings of string insulator units – Dimensions and tests*

IEC 60433, *Insulators for overhead lines with a nominal voltage above 1000 V – Ceramic insulators for AC systems – Characteristics of insulator units of the long rod type*

IEC 60437, *Radio interference test on high-voltage insulators*

IEC 60471, *Clevis and tongue couplings of string insulator units – Dimensions*

IEC 61211, *Insulators of ceramic material or glass for overhead lines with a nominal voltage greater than 1 000 V – Impulse puncture testing in air*

ISO 1459:1973, *Metallic coatings – Protection against corrosion by hot dip galvanizing – Guiding principles*

ISO 1460, *Metallic coatings – Hot dip galvanized coatings on ferrous metals – Determination of the mass per unit area – Gravimetric method*

ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test Methods*

ISO 1463, *Metal and oxide coatings – Measurement of coating thickness – Microscopical method*

ISO 2064, *Metallic and other non-organic coatings – Definitions and conventions concerning the measurement of thickness*

ISO 2178:2016, *Non-magnetic coatings on magnetic substrates – Measurement of coating thickness – Magnetic method*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
insulator string
one or more string insulator units coupled together and intended to give flexible support to conductors and stressed mainly in tension

3.2
rigid insulator
insulator intended to give rigid support to an overhead line conductor and to be stressed mainly by bending and compressive loads

3.3
long rod insulator
rigid insulator intended to be subjected to tensile loads, comprising an insulating part having an approximately circular cylindrical shank, with or without sheds, and external or internal fixing devices attached to each end

3.4
cap and pin insulator
insulator comprising an insulating part usually having the form of a disk or bell, with or without ribs on its surface, and end fittings consisting of an outside cap and an inside pin attached axially

3.5
pin insulator
rigid insulator consisting of an insulating component intended to be mounted rigidly on a supporting structure by means of a pin passing up inside the insulating component which consists of one or more pieces of insulating material permanently connected together

Note 1 to entry: The pin can have two basic shapes. With one shape, the insulating component is fixed to the end of the pin and does not allow contact of the insulating component with the supporting structure. With the other shape, the insulating component is fixed by means of the pin in contact with the supporting structure either directly or with a plate in between, the plate being either a separate washer or part of the pin (sometimes referred to as a pin post insulator).

3.6
line post insulator
rigid insulator intended to be subjected to cantilever, tensile and compressive loads, constructed with one or more insulating materials and assembled on a metal base that is intended to be mounted rigidly on a supporting structure

3.7
traction insulator
insulator or insulator set intended to give flexible or rigid support for overhead electric traction lines. All types of overhead line insulators may be used for this purpose.

3.8
annealed glass
glass which has been treated to eliminate internal stresses

3.9
toughened glass
glass in which pre-stresses have been created in order to improve its mechanical characteristics

3.10
lot
group of insulators offered for acceptance from the same manufacturer, of the same design and manufactured under presumed similar conditions of production

Note 1 to entry: One or more lots may be offered together for acceptance; the lot(s) offered may consist of the whole, or part, of the quantity ordered.

3.11
flashover (of an insulator)
disruptive discharge external to the insulator, and over its surface, connecting those parts which normally have the operating voltage between them

3.12
impulse withstand voltage
highest peak value of impulse voltage of prescribed form and polarity which does not cause breakdown of insulation under specified conditions

3.13
power frequency withstand voltage
RMS value of sinusoidal power frequency voltage that the insulation of the given equipment can withstand during tests made under specified conditions and for a specified duration

3.14
electromechanical failing load
maximum load reached when a string insulator unit is tested under the prescribed conditions of the test

3.15
mechanical failing load
maximum load reached when an insulator is tested under the prescribed conditions of test

3.16
specified mechanical failing load, SFL
mechanical load that causes the loss of mechanical characteristics of any part of an insulator, when tested according to the relevant standard

Note 1 to entry: SFL can also be used for specified electromechanical failing load.

3.17
puncture (of an insulator)
disruptive discharge passing through the solid insulating material of the insulator which produces a permanent loss of dielectric strength

3.18
creepage distance
shortest distance or the sum of the shortest distances along the surface on an insulator between two conductive parts which normally have the operating voltage between them

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

Note 2 to entry: If a high resistance coating is applied to parts of the insulating part of an insulator, such parts are considered to be effective insulating surfaces and the distance over them is included in the creepage distance.

Note 3 to entry: Insulators with grooves e.g. pin insulators, the creepage measurements shall start at the centre of the side groove.

3.19
minimum creepage distance
defined minimum allowed creepage distance which cannot be subject to a specified negative tolerance

3.20
nominal creepage distance
value of the creepage distance which can also be subject to a specified positive or negative tolerance

3.21
minimum nominal creepage distance
defined minimum allowed creepage distance which can also be subject to a specified negative tolerance

Note 1 to entry: Minimum nominal creepage distance is a definition that normally applies to cap and pin insulators.

3.22
displacements
axial displacement
maximum positional variation, parallel to the insulator axis, of a definite point on the circumference of the considered insulator during one complete revolution around the insulator axis

radial displacement
maximum positional variation, perpendicular to the insulator axis, of a definite point on the circumference of the considered insulator during one complete revolution around the insulator axis

angular displacement
angular deviation around the insulator axis between corresponding planes of the two coupling pieces

3.23
short standard string
string used to verify characteristics of a unit which are significant only to an insulator string

<for cap and pin units> insulator string of 5 insulator units

<for long rod insulator units> insulator string between 1 m and 2 m in length for long rod insulator units intended to be assembled in a string

Note 1 to entry: For long rod insulators less than 1 m long intended to be used as a string, the unit itself is considered as a short standard string.

Note 2 to entry: The definition short standard string is different to the definition of short string in IEC 61467.

Note 3 to entry: For systems with insulator string with less than 5 insulators, must be considered the string with the real number of insulators.

3.24
specified characteristic
<domain> numeric value of a voltage or of a mechanical load or any other characteristic specified in an IEC international standard

<domain> numeric value of any such characteristic agreed between the purchaser and the manufacturer

4 Classification, types of insulators and insulating materials

4.1 Insulator classes

Insulators for overhead lines are divided into two classes according to their design:

Class A: an insulator or string insulator unit in which the length of the shortest puncture path through solid insulating material is at least equal to half the arcing distance. An example of a class A insulator is a long rod insulator with external fittings.

Class B: an insulator or string insulator unit in which the length of the shortest puncture path through solid insulating material is less than half the arcing distance. An example of a class B insulator is a cap and pin insulator.