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Selection and dimensioning of high-voltage insulators intended for use in polluted conditions -
Part 3: Polymer insulators for AC systems

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Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 3: Polymer insulators for AC systems

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IEC TS 60815-3 has been prepared by IEC technical committee 36: Insulators. It is a Technical Specification.

This second edition of IEC TS 60815-3, together with IEC TS 60815-1, cancels and replaces the first edition of IEC TS 60815-3:2008. This edition constitutes a technical revision.

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

a) Terms and definitions are modified or introduced in this document;
b) From RUSCD of reference insulator to USCD of candidate insulator, the correction factors are introduced and revised, such as altitude correction, diameter correction, shed profile correction and parallel insulator number correction;

c) The general guidance on materials is revised. The concept of hydrophobicity transfer and hydrophobicity transfer material (HTM) are introduced, recognising that a reduced creepage distance may be used for HTM insulators.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
36/613/DTS	36/636/RVDTS

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 Technical Specification 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 the parts in the future IEC 60815 series, under the general title *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions*, 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– withdrawn, or

– revised.

1 Scope

This part of IEC 60815, which is a technical specification, is applicable for the selection of polymeric insulators for AC systems, and the determination of their relevant dimensions, to be used in high voltage systems with respect to pollution. The specification applies to insulators for outdoor installation only.

This document gives specific guidelines and principles to arrive at an informed judgement on the probable behaviour of a given insulator in certain pollution environment.

The contents of this document are based on CIGRE TB 158 and CIGRE TB 361 [1][1], [2], which form a useful complement to this document for those wishing to study in greater depth the performance of insulators under pollution.

This document does not deal with the effects of snow or ice on polluted insulators. Although this subject is dealt with by CIGRE TB 158 [1], current knowledge is very limited and practice is too diverse.

The objective of this document is to give the user means to

- determine the reference unified specific creepage distance (RUSCD) from site pollution severity (SPS) value or class,
- choose appropriate profiles,
- apply correction factors for altitude, insulator shape, size and position, etc. to the RUSCD.

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 60050-471, *International Electrotechnical Vocabulary (IEV) - Part 471: Insulators*

IEC TS 60815-1:2025, *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 1: Definitions, information and general principles*

[1] Numbers in square brackets refer to the bibliography.

Bibliography

[1] CIGRE Taskforce 33.04.01, *Polluted insulators: A review of current knowledge*, CIGRE Technical Brochure No. 158-2000

[2] CIGRE WG C4.303, *Outdoor insulation in polluted conditions: Guidelines for selection and dimensioning - Part 1: General principles and the AC case*, CIGRE Technical Brochure No. 361-2008

[3] IEC TR 60815:1986, *Guide for the selection of insulators in respect of polluted conditions*

[4] IEC 60050-614, *International Electrotechnical Vocabulary (IEV) - Part 614: Generation, transmission and distribution of electricity - Operation*

[5] IEC 60383-1, *Insulators for overhead lines with a nominal voltage above 1000 V - Part 1: Ceramic or glass insulator units for AC systems - Definitions, test methods and acceptance criteria*

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

[7] CIGRE WG D1.44, *Guidelines for altitude correction of pollution performance of insulators*, CIGRE Technical Brochure No. 705-2017

[8] CIGRE WG C4.303, *Outdoor insulation in polluted conditions: Guidelines for selection and dimensioning – Part 2: The DC Case*, CIGRE Technical Brochure No. 518-2012

[9] CIGRE WG C4.303, *Artificial pollution test for polymer insulators Results of round robin test*, CIGRE Technical Brochure No. 555-2013

[10] CIGRE WG D1.44, *Pollution test of naturally and artificially contaminated insulators*, CIGRE Technical Brochure No. 691-2017

[11] CIGRE WG B2.03 – *Guide for the establishment of naturally polluted insulator testing stations*, CIGRE Technical brochure No. 333-2007

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