

INTERNATIONAL STANDARD

IEC 60433

Third edition
1998-08

**Insulators for overhead lines with
a nominal voltage above 1 000 V –
Ceramic insulators for a.c. systems –
Characteristics of insulator units
of the long rod type**

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International Electrotechnical Commission
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

**Ceramic insulators for a.c. systems –
Characteristics of insulator units of the long rod type**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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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International Standard IEC 60433 has been prepared by subcommittee 36B: Insulators for overhead lines, of IEC technical committee 36: Insulators.

This third edition cancels and replaces the second edition published in 1980 and constitutes a technical revision.

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

FDIS	Report on voting
36B/180/FDIS	36B/184/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.

**INSULATORS FOR OVERHEAD LINES
WITH A NOMINAL VOLTAGE ABOVE 1 000 V –
Ceramic insulators for a.c. systems –
Characteristics of insulator units of the long rod type**

1 Scope

This International Standard is applicable to string insulator units of the long rod type with insulating parts of ceramic material intended for use in a.c. overhead power lines with a nominal voltage greater than 1 000 V and a frequency not greater than 100 Hz. It is also applicable to insulators of similar design, used in substations.

This standard is applicable to ceramic string insulator units of the long rod type, either with a clevis end fitting at both ends for coupling with a tongue, or with a socket end fitting at both ends for coupling with a pin ball.

The object of this standard is to prescribe specified values for electrical and mechanical characteristics, and for the principal dimensions of ceramic string insulator units of the long rod type.

This standard is applicable to string insulator units for use on overhead lines situated in lightly polluted areas, and the creepage distances given in table 1 have been established accordingly, using the IEC 60815 recommendation of 16 mm/kV for pollution level I. However, shorter creepage distances may be used in some non-polluted areas. If specific operating conditions require or allow non-standard (longer or shorter) creepage distances, the mechanical characteristics as well as the lengths L (see clause 4) of this standard should be used unless the need for exceptionally long creepage distances requires values of L greater than those given in table 1. In the case of special requirements, e.g. very heavy polluted areas and for other particular or extreme environmental conditions, it may be necessary for certain dimensions to be changed.

NOTES

- 1 As far as reasonably applicable, this International Standard may also be applied to similar insulator units outside the scope of this standard, such as insulators for electric traction lines.
- 2 This International Standard does not include tests on insulators and dimensions of end fittings.
- 3 Ball and socket couplings are covered by IEC 60120, clevis and tongue couplings by IEC 60471.
- 4 For the definition of pollution levels, see IEC 60815.
- 5 The term "ceramic" is used in this International Standard to refer to porcelain materials and, contrary to North American practice, does not include glasses.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60071-1:1993, *Insulation co-ordination – Part 1: Definitions, principles and rules*

IEC 60120:1984, *Dimensions of ball and socket couplings of string insulator units*

IEC 60383-1:1993, *Insulators for overhead lines with a nominal voltage above 1 000 V – Part 1: Ceramic or glass insulator units for a.c. systems – Definitions, test methods and acceptance criteria*

IEC 60471:1977, *Dimensions of clevis and tongue couplings of string insulator units*

IEC 60672-1:1995, *Ceramic and glass insulating materials – Part 1: Definitions and classification*

IEC 60672-3:1997, *Ceramic and glass insulating materials – Part 3: Specification for individual materials*

IEC 60815:1986 *Guide for the selection of insulators in respect of polluted conditions*

3 Definition

For the purposes of this International Standard, the following definition applies:

3.1

long rod insulator

suspension or tension insulator consisting of an approximately cylindrical insulating part provided with sheds and equipped at the ends with external metal fittings

The insulator is designed in such a manner that the shortest puncture path through solid insulating material is at least equal to half the arcing distance. Therefore it is a class A insulator according to IEC 60383-1.

4 Characteristics

String insulator units of the long rod type are characterised by the following specified characteristics:

- the standard lightning impulse withstand voltage (see IEC 60071-1);
- the wet power frequency withstand voltage (see IEC 60071-1);
- the tensile mechanical failing load;
- the maximum nominal length L of the insulator;
- the maximum nominal diameter D of the insulating part ;
- the minimum nominal creepage distance;
- the standard coupling.