

Insulators of ceramic material or glass for overhead lines with a nominal voltage greater than 1 000 V — Impulse puncture testing in air

The European Standard EN 61211:2005 has the status of a British Standard

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National foreword

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Summary of pages

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**Insulators of ceramic material or glass for overhead lines
with a nominal voltage greater than 1 000 V –
Impulse puncture testing in air
(IEC 61211:2004)**

Isolateurs en matière céramique
ou en verre destinés aux lignes aériennes
de tension nominale supérieure à 1 000 V –
Essais de perforation par chocs dans l'air
(CEI 61211:2004)

Isolatoren aus keramischem Werkstoff
oder Glas für Freileitungen mit einer
Nennspannung über 1 kV –
Stoßspannungs-Durchschlagsprüfungen
unter Luftatmosphäre
(IEC 61211:2004)

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CENELEC

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

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Foreword

The text of document 36B/239/FDIS, future edition 2 of IEC 61211, prepared by SC 36B, Insulators for overhead lines, of IEC TC 36, Insulators, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61211 on 2005-03-01.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2005-12-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2008-03-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61211:2004 was approved by CENELEC as a European Standard without any modification.

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INTRODUCTION

The text of this International Standard is based on the work of Maintenance Team 13 of IEC SC 36B and CIGRE Task Force 33.07.01 and on two ELECTRA reports. Reference is made to these two reports in the text by [1] and [2]¹.

A power frequency puncture test on insulators in oil is specified in IEC 60383-1(1993) as a sample test. An impulse voltage puncture test on insulators in air is required and applied in more and more countries and by a growing number of utilities. The applied test procedures differed from each other considerably. The first edition of IEC 61211(1994) gave a common specification for an impulse over-voltage test as an alternative. That edition specified the test method and acceptance criteria, and also gave guidance for performing the test and for measuring the test voltage.

CIGRE WG 33.03 has followed up the edition 1 since its publication in 1994. Information has been gathered on the usage of the technical report and on the development of test and measurement techniques for impulse voltage puncture withstand tests on insulators in air. In time, interest in this impulse puncture test on insulators in air has considerably increased.

Based on follow-up by CIGRE WG 33.03, IEC subcommittee 36B (Insulators for overhead lines) decided to revise IEC 61211 with the aim to convert it into a standard.

In this standard, the changes vis-à-vis the technical report are not dramatic. The main changes are related to using per unit values in the specification of test voltage, defining measurement uncertainty and improvements in the test procedure. In addition, minor clarifying changes have been made in the test assembly and in requirements for test voltage measuring systems. Unnecessary annexes have been deleted and replaced by a bibliography.

In reference to the original motivation for the technical report and to gathered experience, the importance of the peak voltage criterion in specifying the test voltage magnitude is stressed for achieving reproducibility of the test. The steepness criterion cannot be adopted, because with this the test voltage strongly depends on source impedance of the test circuit and on impulse front linearity.

Further to peak value, the test procedure has to be specified in detail for reproducibility of the test. Polarity of the impulse related to the pin, starting polarity, possible polarity reversals and time interval between consecutive impulses may affect the severity of the test, and hence have to be specified.

It is clear that measurement of these short impulse voltages needs special attention to achieve an acceptable accuracy. IEC 60060 does not fully cover this topic. Consequently, special requirements and guidance for measurements are given in Annex B.

This international standard assumes that the manufacturer specifies the impulse puncture withstand voltage as a characteristic of the insulator unit. This voltage is defined as peak value of the measured voltage across the insulator in the actual test. Until such time as the relevant product standards give specified values for the impulse puncture withstand voltage, this standard gives recommended test voltage values for different types of insulator units on the basis of per unit (p.u.) values.

The puncture strength of insulators depends on both design and quality of manufacturing. Therefore both a type test and a sample test procedure are given.

¹ References in square brackets refer to the bibliography.