

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**High-voltage test techniques –
Part 1: General definitions and test requirements**

**Technique des essais à haute tension –
Partie 1: Définitions et exigences générales**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE TEST TECHNIQUES –**Part 1: General definitions and test requirements**

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International Standard IEC 60060-1 has been prepared by IEC technical committee 42: High-voltage test techniques.

This third edition of IEC 60060-1 cancels and replaces the second edition, published in 1989, and constitutes a technical revision.

The significant technical changes with respect to the previous edition are as follows:

- a) The general layout and text was updated and improved to make the standard easier to use.
- b) Artificial pollution test procedures were removed as they are now described in IEC 60507.
- c) Measurement of impulse current has been transferred to a new standard on current measurement (IEC 62475).
- d) The atmospheric correction factors are now presented as formulas.

- e) A new method has been introduced for the calculation of the time parameters of lightning impulse waveforms. This improves the measurement of the time parameters of lightning impulses with oscillations or overshoot.

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

FDIS	Report on voting
42/277/FDIS	42/282/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.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2

A list of all the parts in the IEC 60060 series, under the general title *High-voltage test techniques*, can be found on the IEC website.

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

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- withdrawn;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

HIGH-VOLTAGE TEST TECHNIQUES –

Part 1: General definitions and test requirements

1 Scope

This part of IEC 60060 is applicable to:

- dielectric tests with direct voltage;
- dielectric tests with alternating voltage;
- dielectric tests with impulse voltage;
- dielectric tests with combinations of the above.

This part is applicable to tests on equipment having its highest voltage for equipment U_m above 1 kV.

NOTE 1 Alternative test procedures may be required to obtain reproducible and significant results. The choice of a suitable test procedure should be made by the relevant Technical Committee.

NOTE 2 For voltages U_m above 800 kV meeting some specified procedures, tolerances and uncertainties may not be achievable.

2 Normative references

The following referenced documents are indispensable for the application 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 60060-2, *High-voltage test techniques – Part 2: Measuring systems*

IEC 60270, *High-voltage test techniques – Partial discharge measurements*

IEC 60507:1991, *Artificial pollution tests on high-voltage insulators to be used on a.c. systems*

IEC 61083-1, *Instruments and software used for measurement in high-voltage impulse tests – Part 1: Requirements for instruments*

IEC 61083-2, *Digital recorders for measurements in high-voltage impulse tests – Part 2: Evaluation of software used for the determination of the parameters of impulse waveforms*

IEC 62475, *High-current test techniques: Definitions and requirements for test currents and measuring systems*

3 Terms and definitions

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

3.1 Definitions related to characteristics of discharges

3.1.1

disruptive discharge

failure of insulation under electric stress, in which the discharge completely bridges the insulation under test, reducing the voltage between electrodes to practically zero

NOTE 1 Non-sustained disruptive discharge in which the test object is momentarily bridged by a spark or arc may occur. During these events the voltage across the test object is momentarily reduced to zero or to a very small value. Depending on the characteristics of the test circuit and the test object, a recovery of dielectric strength may occur and may even allow the test voltage to reach a higher value. Such an event should be interpreted as a disruptive discharge unless otherwise specified by the relevant Technical Committee.

NOTE 2 A disruptive discharge in a solid dielectric produces permanent loss of dielectric strength; in a liquid or gaseous dielectric the loss may be only temporary.

3.1.2

sparkover

disruptive discharge that occurs in a gaseous or liquid dielectric

3.1.3

flashover

disruptive discharge that occurs over the surface of a dielectric in a gaseous or liquid dielectric

3.1.4

puncture

disruptive discharge that occurs through a solid dielectric

3.1.5

disruptive-discharge voltage value of a test object

value of the test voltage causing disruptive discharge, as specified, for the various tests, in the relevant clauses of the present standard

3.1.6

non-disruptive discharge

discharge between intermediate electrodes or conductors where the test voltage does not collapse to zero

NOTE 1 Such an event should not be interpreted as a disruptive discharge unless so specified by the relevant Technical Committee.

NOTE 2 Some non-disruptive discharges are termed “partial discharges” and are dealt with in IEC 60270.

3.2 Definitions relating to characteristics of the test voltage

3.2.1

prospective characteristics of a test voltage

characteristics which would have been obtained if no disruptive discharge had occurred. When a prospective characteristic is used, this shall always be stated.

3.2.2

actual characteristics of a test voltage

those characteristics which occur during the test at the terminals of the test object

3.2.3

value of the test voltage

as defined in the relevant clauses of this standard