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SIST EN 60168:1997/A1:1998

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60168/A1

July 1987

ICS 29.080.10

Descriptors: Post insulators, ceramic material, glass, test

English version

**Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1 kV
(IEC 60168:1994/A1:1997)**

Essais des supports isolants d'intérieur et d'extérieur, en matière céramique ou en verre, destinés à des installations de tension nominale supérieure à 1 kV
(CEI 60168:1994/A1:1997)

Prüfungen an Innenraum- und Freiluft-Stützisolatoren aus keramischem Werkstoff oder Glas für Systeme mit Nennspannungen über 1 kV
(IEC 60168:1994/A1:1997)

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This amendment A1 modifies the European Standard EN 60168:1994; it was approved by CENELEC on 1997-07-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 36C/81/FDIS, future amendment 1 to IEC 60168:1994, prepared by SC 36C, Insulators for substations, of IEC TC 36, Insulators, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60168:1994 on 1997-07-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-04-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1998-04-01

Endorsement notice

The text of amendment 1:1997 to the International Standard IEC 60168:1994 was approved by CENELEC as an amendment to the European Standard without any modification.

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NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC
60168

1994

AMENDEMENT 1
AMENDMENT 1

1997-06

Amendement 1

**Essais des supports isolants d'intérieur
et d'extérieur, en matière céramique ou en verre,
destinés à des installations de tension nominale
supérieure à 1 000 V**

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Amendment 1

[SIST EN 60168:1997/A1:1998](https://standards.iteh.ai/catalog/standards/sist/1c62667d-1c9a4-4c62-8b41-b13058e58a15/sist-en-60168-1997-a1-1998)

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**Tests on indoor and outdoor post insulators of
ceramic material or glass for systems with
nominal voltages greater than 1 000 V**

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Commission Electrotechnique Internationale
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Международная Электротехническая Комиссия

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FOREWORD

This amendment has been prepared by subcommittee 36C: Insulators for substations, of IEC technical committee 36: Insulators.

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

FDIS	Report on voting
36C/81/FDIS	36C/89/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

Page 19

2.2 Values which characterize a post insulator

Replace the footnote by the following:

* Switching-impulse withstand voltage should be specified only for post insulators for use on a.c. systems with highest voltage for equipment above 245 kV.

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3.1.1 Type tests

Replace, on page 23, the existing text of the last paragraph by the following:

The type tests shall be carried out on insulator(s) which have passed all the requirements for the routine and the sample tests, except the sample mechanical test.

Page 23

3.3.1 Insulator selection for type tests

Replace the text of this subclause by the following:

Normally, only one post insulator shall be subjected to each test. The test shall be carried out on an insulator which has passed all the requirements for the routine and the sample tests, except the sample mechanical test. Insulators which have been submitted to type tests which may affect their mechanical and/or electrical characteristics shall not be used in service.

Page 25

3.3.3 *Electrical type tests*

Replace the second paragraph of this subclause by the following:

The results obtained during the electrical type tests on a post insulator of "electrically equivalent design" shall be extended to all post insulators represented by it. These are insulators made with the same materials and having the following characteristics when compared with the post insulator of "electrically equivalent design":

- a) the arcing distance is the same or greater;
- b) the nominal core diameter is the same or smaller;
- c) the number and approximate position of metal fittings is the same;
- d) the nominal shed spacing is the same within $\pm 5\%$;
- e) the nominal shed projection is the same within $\pm 10\%$;
- f) the shed profile is the same.

3.3.4 *Mechanical failing load type tests*

Replace, on page 27, the first paragraph of this subclause by the following:

The results obtained during the mechanical failing load type tests on a post insulator of "mechanically equivalent design" shall be extended to all post insulators represented by it. These are insulators made in the same factory, with the same materials, and by the same manufacturing process, and having the following characteristics, when compared with the post insulator of "mechanically equivalent design":

- a) the nominal core diameter is the same;
- b) the design of the connection between the insulating component and the metal fittings is the same;
- c) the shape and size of the parts of the metal fittings which connect to the insulating components are the same;
- d) the nominal height does not differ by more than $\pm 20\%$.

Page 33

4.4.1 *Standard mounting arrangement of a post insulator for use in systems with highest voltage of equipment below 300 kV*

Replace the title of this subclause and first and second paragraphs by the following:

4.4.1 *Standard mounting arrangement of a post insulator when switching impulse tests are not required*

The post insulator shall be mounted vertically upright on a horizontal earthed metal support consisting of a U-channel section with the flanges pointing downwards. This metal support shall have a width about equal to the diameter of the mounting face of the post insulator under test and a length at least equal to twice the height of the post insulator, and shall be placed at least 1 m above ground for post insulators not higher than 1,80 m. For higher post insulators, the distance above ground shall be at least 2,50 m.

A cylindrical conductor, maintained in the horizontal plane, and perpendicular to the earthed support, shall be attached to the top of the post insulator. The length of the conductor shall be at least equal to 1,5 times the height of the post insulator and it shall extend at least 1 m on each side of the post insulator axis. The diameter of the conductor shall be approximately 1,5 % of the height of the post insulator, with a minimum of 25 mm.

4.4.2 *Standard mounting arrangement of a post insulator for use in systems with highest voltage of equipment equal to or above 300 kV*

Replace the title of this subclause by the following:

4.4.2 *Standard mounting arrangement of a post insulator when switching impulse tests are required*

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5.2.4.4 *Tests on top metal fittings*

Replace, on page 53, the text of the note by the following:

NOTE – By agreement between the purchaser and the manufacturer the bending moment M at the top metal fitting may be verified by mounting the post insulator in the inverted position, and applying a load at the free end. This method may also be used when the post is not designed with linear progression of mechanical strength.

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5.8.1 *Post insulators with ceramic insulating parts*

Replace the seventh paragraph of this subclause by the following:

On the core of a cylindrical post insulator unit, surface defects such as chips and cracks are not permitted. Areas up to 25 mm² without glaze as well as small inclusions in the glaze are permitted.

Page 67

5.9.1.2 *Unassembled post insulators*

Replace the text of this subclause by the following:

As an alternative to a routine bending test on an assembled post insulator, the routine mechanical test may, by agreement between the purchaser and the manufacturer, be made on the insulating part of a cylindrical post insulator or post insulator unit, prior to assembly. In this case, bending loads shall be applied in several directions. They shall be of sufficient magnitude to ensure that the bending stress achieved at each position along the free or unsupported length of the insulating part is equivalent to at least 70 % and does not exceed 100 % of the stress at that position corresponding to the specified mechanical failing load.

NOTES

- 1 Suitable methods for routine mechanical testing of unfitted insulator units are indicated in annex B.
- 2 It should be noted that this test does not verify the metal fittings or the assembly of the post insulator.

Page 73

Table 3 – Type tests applicable to post insulators

In columns 2, 3, 4 and 5 of the table, replace the words "at or above 300 kV system voltage" by the following:

"on systems with highest voltage for equipment above 245 kV"

Page 75

Table 5 – Routine tests applicable to post insulators

Replace the existing table by the following:

Routine tests on all insulators (see clause 6.3)	Design category defined in 2.1.1 and shown in figures 1 to 6					
	1)	2)	3)	4)	5)	6)
	Post insulators in CERAMIC material					
Clause no. and test:						
5.8 Routine visual inspection	X	X	X	X	X	X
5.9 Routine mechanical test						
Height > 770 mm (Bending test)	X	X	X	X	–	X
Height ≤ 770 mm (Tensile test)	–	–	–	–	X	–
4.10 Routine electrical test	–	Y	–	X	X	Y
	(Y = applicable to ceramic part before assembly)					
	Post insulators in GLASS					
Clause no. and test:						
5.5 Routine thermal shock test		X	X	X	X	X
5.8 Routine visual inspection		X	X	X	X	X
5.9 Routine mechanical test						
Height > 770 mm (Bending test)		X	X	X	–	X
Height ≤ 770 mm (Tensile test)		–	–	–	X	–
NOTE – By agreement between purchaser and manufacturer, for example when required by service applications, alternative or additional routine mechanical tests may be made on post insulators (see clause 5.9).						