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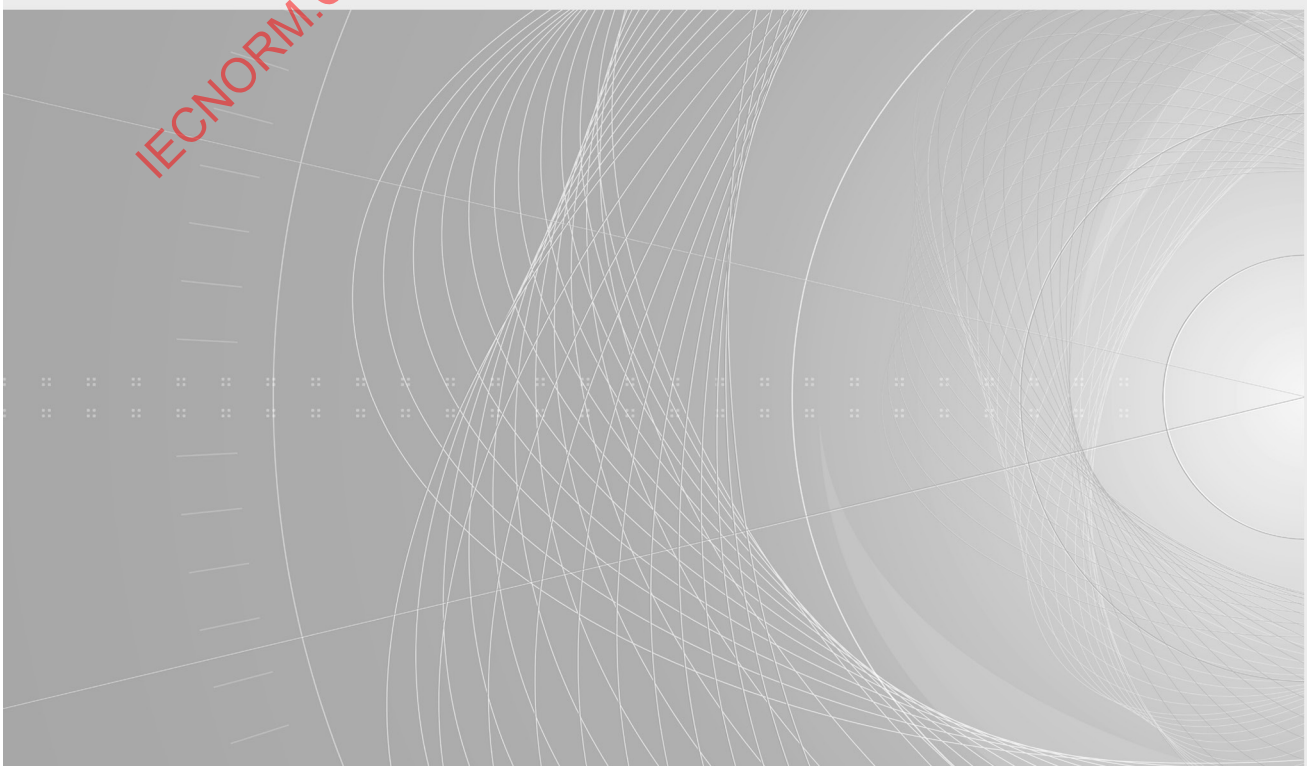
Edition 1.0 2022-09

INTERNATIONAL STANDARD

colour inside

Coaxial communication cables –
Part 1-126: Electrical test methods – Corona extinction voltage



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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COAXIAL COMMUNICATION CABLES –

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FOREWORD

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IEC 61196-1-126 has been prepared by subcommittee 46A: Coaxial cables, of IEC technical committee 46: Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
46A/1582/FDIS	46A/1597/RVD

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 International Standard is English.

A list of all parts in the IEC 61196 series, published under the general title *Coaxial communication cables*, can be found on the IEC website.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.

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- withdrawn,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

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COAXIAL COMMUNICATION CABLES –

Part 1-126: Electrical test methods – Corona extinction voltage

1 Scope

This part of IEC 61196 provides the test method for the corona (partial discharge) extinction voltage of coaxial communication cables under specified environmental conditions.

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

IEC 61196-1, *Coaxial communication cable – Part 1: Generic specification – General, definitions and requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61196-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
partial discharge inception voltage
PDIV
lowest voltage (in V RMS) at which a partial discharge (at least 5 pC and above) is detected when the test voltage is slowly increased between the inner and outer conductors of the cable

3.2
partial discharge extinction voltage
PDEV
highest voltage (in V RMS) at which partial discharge no longer occurs as the applied voltage between the inner and outer conductors of the cable is decreased from the inception voltage (3.1)

4 Preparation of test sample

4.1 Flexible cable

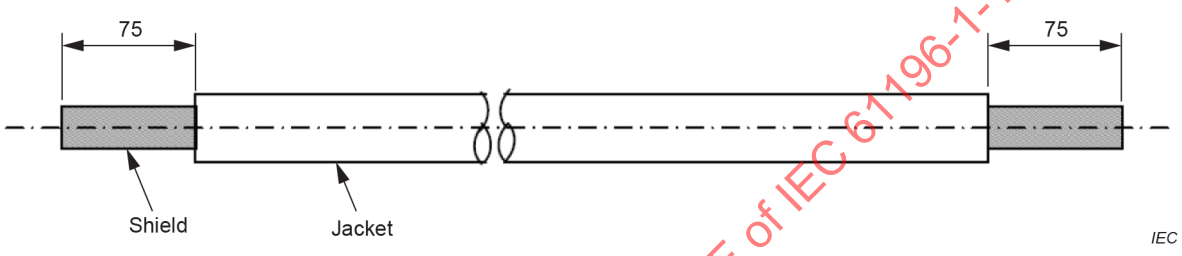
Test samples are prepared as follows:

a) Take a sample of 0,6 m to 1,5 m (1 m is recommended) in length and strip 75 mm of jacket material from each end, as shown in Figure 1a).

b) Roll back the shield over the jacket and trim as shown in Figure 1b). Avoid breaking any strands. Trim the shield edges to nearly 25 mm lengths.

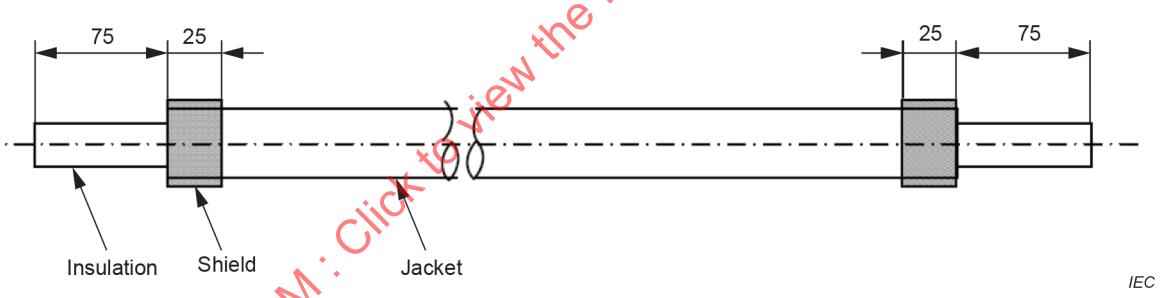
c) Trim the insulation of one end of the sample to the dimensions shown in Figure 1c) and wrap the shield edge and jacket with a plastic tube or adhesive tape or heat-shrink sleeve, and wrap a grounding copper wire 0,8 mm in diameter tightly around the other end of the shielding layer, or use an equivalent grounding method.

Dimensions in millimetres



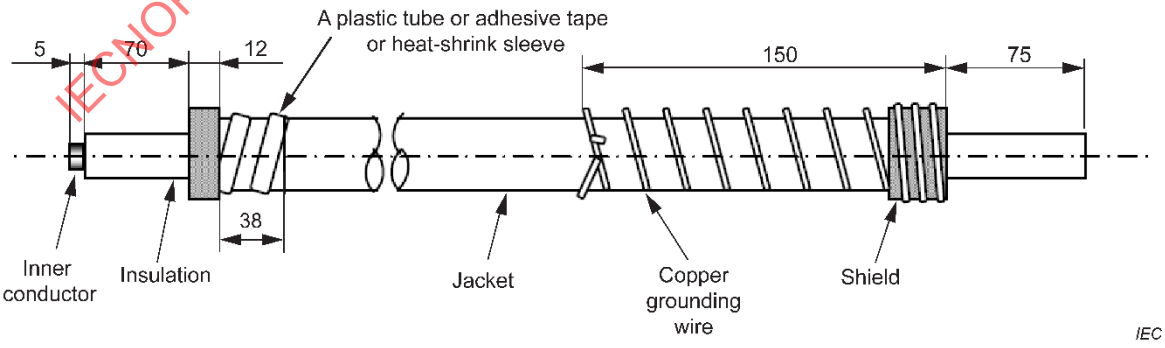
a) Striped jacket

Dimensions in millimetres



b) Rolled back the shield over the jacket

Dimensions in millimetres



c) Trim one end of the sample and wrap the shield and jacket

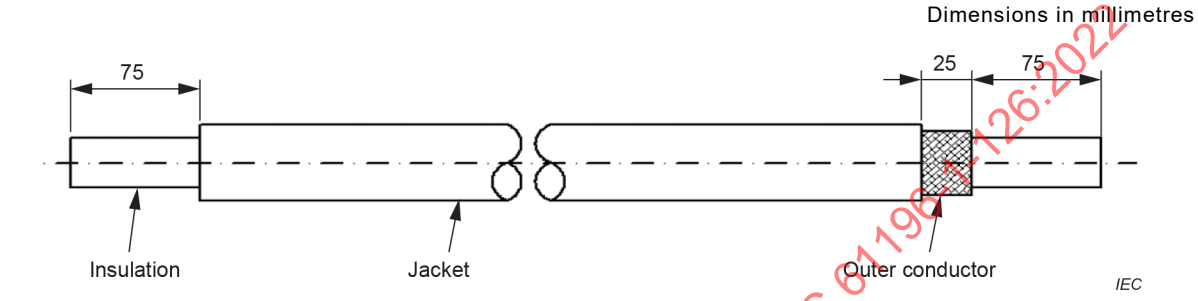
Figure 1 – Preparation of flexible cable sample

4.2 Semi-flexible cable

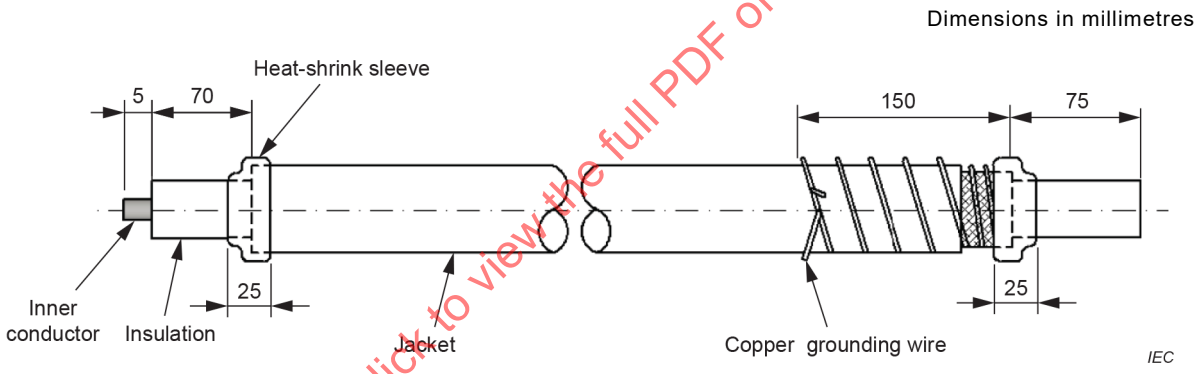
Test samples are prepared as follows:

a) Take a sample of 0,6 m to 1,5 m (1 m is recommended) in length and strip jacket and outer conductor material from each end and trim the sample to the dimensions shown in Figure 2a).

b) Trim the end where only the insulation is exposed to the dimensions shown in Figure 2b) and tightly wind a grounding copper wire 0,8 mm in diameter around the other end of the outer conductor, or use an equivalent grounding method, then cover both ends of the outer conductor tightly with heat-shrinkable sleeves.



a) Strip off the jacket and outer conductor



b) Trim one end of the sample and wrap and cover the outer conductor

Figure 2 – Preparation of semi-flexible cable sample

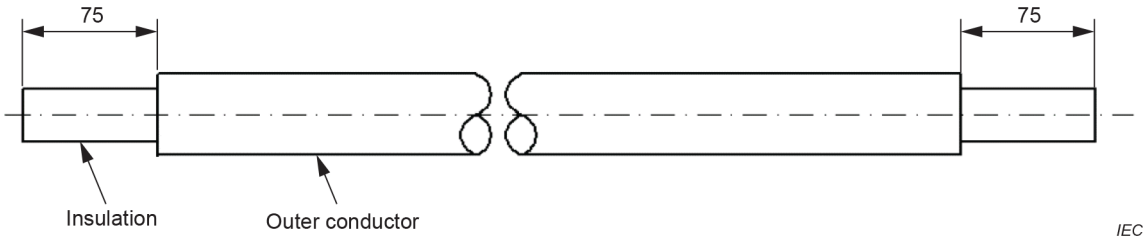
4.3 Semi-rigid cable and unjacketed semi-flexible cable

Test samples are prepared as follows:

a) Take a sample of 0,6 m to 1,5 m (1 m is recommended) in length and strip 75 mm of outer conductor material from each end, as shown in Figure 3a).

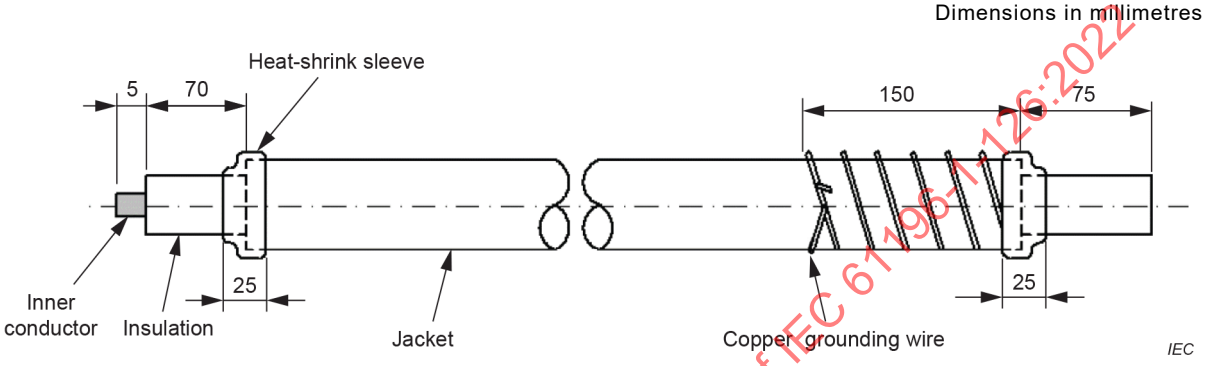
b) Trim one end of the sample to the dimensions shown in Figure 3b) and tightly wind a grounding copper wire 0,8 mm in diameter around the other end of the outer conductor, or use an equivalent grounding method, and then both ends of the outer conductor are tightly covered with heat-shrinkable sleeves.

Dimensions in millimetres



a) Strip off the outer conductor

Dimensions in millimetres

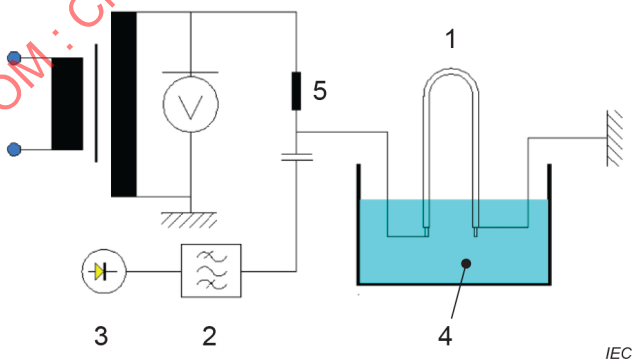


b) Trim one end of the sample and wrap and cover the outer conductor

Figure 3 – Preparation of semi-rigid cable and unjacketed semi-flexible cable sample

5 Test principle

The test principle is shown in Figure 4. The test voltage is slowly increased between the inner and outer conductors of the cable, and as the voltage increases to a certain critical value, the detector will detect the partial discharge phenomenon of 5 pC and above. When the test voltage is slowly reduced, the discharge phenomenon will disappear.



NOTE

1 cable under test

2 band pass filter (10 kHz to 50 kHz)

3 detector

4 oil

5 choke

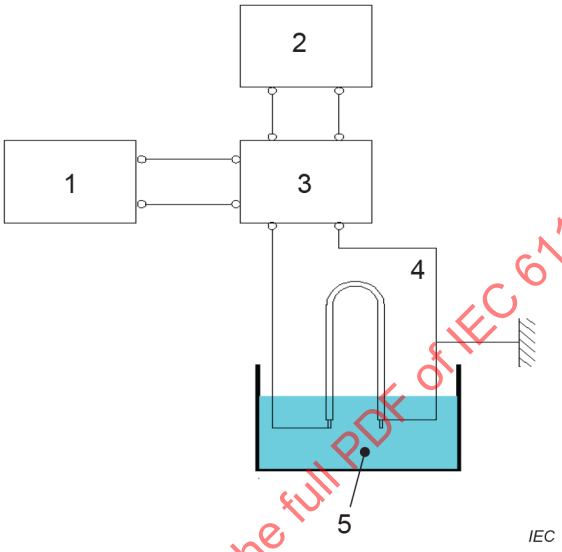
Figure 4 – Test principle diagram

6 Test equipment

The test equipment includes: a high voltage source, a fault indicator, an oscilloscope, a partial discharge free-adapter, an altitude test chamber (when applicable), and associated instrumentation.

The equipment shall be capable of detecting a partial discharge of 5 pC or less. The frequency of the test voltage shall be 40 Hz to 60 Hz.

The test equipment should be assembled in accordance with Figure 5.



NOTE

1 high-voltage source
2 oscilloscope
3 fault indicator
4 cable under test
5 oil

Figure 5 – Layout of test equipment

7 Calibration of measuring system

The object of calibration is to verify that the measuring system is able to measure the specified PD magnitude correctly.

The calibration shall be done in accordance with the procedure described in IEC 60270.

8 Test procedure

Test procedure is as follows:

a) The test setup shall be energized without the test sample to ensure that it is partial discharge-free at a minimum of 1 000 V above the required test voltage (as specified in the relevant detail specification or product specification) and does not breakdown.

b) The cable sample shall be inserted in the test setup. If necessary, to prevent partial discharge at the cable ends, the cable ends may be immersed in insulating oil. Other preventive measures may be used.