

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electric and optical fibre cables – Test methods for non-metallic materials –
Part 301: Electrical tests – Measurement of the permittivity at 23 °C of filling
compounds

Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux
non-métalliques –
Partie 301: Essais électriques – Mesure de la permittivité à 23 °C des matières
de remplissage



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRIC AND OPTICAL FIBRE CABLES –
TEST METHODS FOR NON-METALLIC MATERIALS –****Part 301: Electrical tests –
Measurement of the permittivity at 23 °C of filling compounds**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). 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. 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 60811-301 has been prepared by IEC technical committee 20: Electric cables.

This Part 301 of IEC 60811 cancels and replaces Clause 9 of IEC 60811-5-1:1990, which is withdrawn. Full details of the replacements are shown in Annex A of IEC 60811-100:2012.

There are no specific technical changes with respect to the previous edition, but see the Foreword to IEC 60811-100:2012.

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

FDIS	Report on voting
20/1283/FDIS	20/1332/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.

This part of IEC 60811 shall be read in conjunction with IEC 60811-100.

A list of all the parts in the IEC 60811 series, published under the general title *Electric and optical fibre cables – Test methods for non-metallic materials*, 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 web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

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INTRODUCTION

The IEC 60811 series specifies the test methods to be used for testing non-metallic materials of all types of cables. These test methods are intended to be referenced in standards for cable construction and for cable materials.

NOTE 1 Non-metallic materials are typically used for insulating, sheathing, bedding, filling or taping within cables.

NOTE 2 These test methods are accepted as basic and fundamental and have been developed and used over many years, principally for the materials in all energy cables. They have also been widely accepted and used for other cables, in particular optical fibre cables, communication and control cables and cables for ships and offshore applications.

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ELECTRIC AND OPTICAL FIBRE CABLES – TEST METHODS FOR NON-METALLIC MATERIALS –

Part 301: Electrical tests – Measurement of the permittivity at 23 °C of filling compounds

1 Scope

This Part 301 of IEC 60811 gives the procedure to determine the permittivity at 23 °C which typically applies to filling compounds used for optical cables, communication cables and optical fibre cables.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60247, *Insulating liquids – Measurement of relative permittivity, dielectric dissipation factor ($\tan \delta$) and d.c. resistivity*

IEC 60811-100:2012, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 100: General*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60811-100 apply.

4 Test method

4.1 General

This part of IEC 60811 shall be used in conjunction with IEC 60811-100.

This test shall be carried out in accordance with the method specified in IEC 60247.

4.2 Apparatus

The test apparatus used shall be a three-terminal cell as described in IEC 60247.

4.3 Sample and test piece preparation

In addition to details given in IEC 60247, the filling compound shall be heated to its clarify point and poured into the cell which has been preheated to the same temperature.

4.4 Ageing procedure

This test shall be carried out according to IEC 60247. Care shall be taken that no air bubbles are introduced into the cell.

The test shall be carried out at temperatures of (23 ± 2) °C.

4.5 Measurements

Measurement details are given in IEC 60247.

4.6 Expression of the results

Calculation details are given in IEC 60247.

5 Test report

In addition to the test report given in IEC 60247, the test report shall be in accordance with that given in IEC 60811-100.

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Bibliography

IEC 60811-5-1:1990, *Common test methods for insulating and sheathing materials of electric cables – Part 5: Methods specific to filling compounds – Section One — Drop-point — Separation of oil — Lower temperature brittleness — Total acid number — Absence of corrosive components — Permittivity at 23 °C — D.C. resistivity at 23 °C and 100 °C* (withdrawn)

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