IEC 60811-100

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electric and optical fibre cables – Test methods for non-metallic materials – Part 100: General

Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux non-métalliques – Partie 100: Généralités

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 100: General

FOREWORD

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International Standard IEC 60811-100 has been prepared by IEC technical committee 20: Electric cables.

This first edition of IEC 60811-100 collects together general matters that apply to the restructured IEC 60811 series. A detailed explanation is provided in the Introduction. Annex A provides full information on the relation between the current and the previous series.

This revised series of IEC 60811 is based upon the principle of "one test – one part". One significant technical change that now applies throughout the series is a defined minimum scheme for the presentation of test reports.

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

FDIS	Report on voting
20/1279/FDIS	20/1328/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 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- withdrawn,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.

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.

Each test method is contained in a separately numbered part. These respective parts are identified in Table A.1 of Annex A, with the corresponding clauses from the previous version of this part given for information. Table A.2 of Annex A lists the clauses of the previous version, to facilitate location of the corresponding part in the current version.

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

Part 100: General

1 Scope

This Part 100 of IEC 60811 describes general requirements and considerations that are applicable to all the test methods given in the particular parts, unless otherwise specified.

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 60050-461, *International Electrotechnical Vocabulary – Part 461: Electric cables*

IEC 60502-1, *Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1,2 kV) up to 30 kV (U_m = 36 kV) – Part 1: Cables for rated voltages of 1 kV (U_m = 1,2 kV) and 3 kV (U_m =3,6 kV)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-461, together with the following, apply.

3.1
median value
when several test results have been obtained and ordered in an increasing (or decreasing) succession, the median value is the middle value if the number of available values is odd, and the mean of the two middle values if the number is even

4 Test values

Full test conditions (such as temperatures, durations, etc.) and full test requirements are not specified in the particular parts of IEC 60811. It is intended that they should be specified by the standard dealing with the relevant type of cable.

Rounding rules as specified in IEC 60502-1 shall be used, unless specified in particular parts.

Any test requirements which are given in the particular parts of IEC 60811 may be modified by the relevant cable standard to suit the needs of a particular type of cable.

5 Applicability

Conditioning values and testing parameters are specified where appropriate for the most common types of insulating and sheathing compounds and of cables.

Where not specified in particular parts, a minimum stabilization time of 16 h shall elapse after extrusion or application as appropriate, before testing.

Unless otherwise specified in particular parts, testing shall be carried out at room temperature: (23 ± 5) °C.

6 Type tests and other tests

The test methods described in the particular parts of IEC 60811 are primarily intended to be used for type tests. In certain tests, where there are essential differences between the conditions for type tests and those for more frequent tests, such as routine tests, these differences are indicated.

7 Test report

The test report shall contain the following minimum information:

a) The type and identification of the tested material and of the cable from which it comes.
b) Reference to the particular part and test method of IEC 60811, where alternatives exist.
c) Test conditions, for example duration, temperature.
d) The date of the test.
e) The result of the test and associated specified requirements.
f) State compliance or non-compliance to specified requirements.

Any deviation from the specified procedure shall be recorded.

Annex A
(informative)

Structure and content of IEC 60811

Table A.1 – Parts and their previous reference

Part	Title	Previous reference
General		
100	General	N/A
General tests		
201	Measurement of insulation thickness	60811-1-1
202	Measurement of thickness of non-metallic sheath	60811-1-1
203	Measurement of overall dimensions	60811-1-1
Electrical tests		
301	Measurement of the permittivity at 23 °C of filling compounds	60811-5-1
302	Measurement of the d.c. resistivity at 23 °C and 100 °C of filling compounds	60811-5-1
Miscellaneous tests		
401	Thermal ageing methods. Ageing in an air oven (Method 8.3 deleted)	60811-1-2
402	Water absorption tests	60811-1-3
403	Ozone resistance test on cross-linked compounds	60811-2-1
404	Mineral oil immersion tests for sheaths	60811-2-1
405	Thermal stability test for PVC insulations and PVC sheaths	60811-3-2
406	Resistance to stress cracking of polyethylene and polypropylene compounds	60811-4-1
407	Measurement of mass increase of polyethylene and polypropylene compounds	60811-4-2
408	Long-term stability test of polyethylene and polypropylene compounds	60811-4-2
409	Loss of mass test for thermoplastic insulations and sheaths	60811-3-2
410	Test method for copper-catalyzed oxidative degradation of polyolefin insulated conductors	60811-4-2
411	Low temperature brittleness of filling compounds	60811-5-1
412	Thermal ageing methods - Ageing in an air bomb	60811-1-2
Mechanical tests		
501	Tests for determining the mechanical properties of insulating and sheathing compounds	60811-1-1
502	Shrinkage test for insulations	60811-1-3
503	Shrinkage test for sheaths	60811-1-3
504	Bending tests at low temperature for insulation and sheaths	60811-1-4
505	Elongation at low temperature for insulations and sheaths	60811-1-4
506	Impact test at low temperature for insulations and sheaths	60811-1-4
507	Hot set test for cross-linked materials	60811-2-1
508	Pressure test at high temperature for insulation and sheaths	60811-3-1
509	Test for resistance of insulations and sheaths to cracking (heat shock test)	60811-3-1
510	Methods specific to polyethylene and polypropylene compounds – Wrapping test after thermal ageing in air	60811-4-2
511	Measurement of the melt flow index of polyethylene compounds	60811-4-1
512	Methods specific to polyethylene and polypropylene compounds - Tensile strength and elongation at break after conditioning at elevated temperature	60811-4-2

Part	Title	Previous reference
513	Methods specific to polyethylene and polypropylene compounds – Wrapping test after conditioning	60811-4-2
Physical tests		
601	Measurement of the drop-point of filling compounds	60811-5-1
602	Separation of oil in filling compounds	60811-5-1
603	Measurement of total acid number of filling compounds	60811-5-1
604	Measurement of absence of corrosive components in filling compounds	60811-5-1
605	Measurement of carbon black and/or mineral filler in polyethylene compounds	60811-4-1
606	Methods for determining the density	60811-1-3
607	Test for the assessment of carbon black dispersion in polyethylene and polypropylene	60811-4-1