BS EN 60811-510:2012

BSI Standards Publication

Electric and optical fibre cables — Test methods for non-metallic materials

Part 510: Mechanical tests — Methods specific to polyethylene and polypropylene compounds — Wrapping test after thermal ageing in air

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National foreword

This British Standard is the UK implementation of EN 60811-510:2012. It is identical to IEC 60811-510:2012.

In the UK, the relationship between the supersessions of BS EN 60811 series can be summarized as follows.

BS EN 60811-100 together with	Supersedes -
-201, -202, -203, -501	BS EN 60811-1-1:1995
-301, -302, -411, -601, -602, -603, -604	BS EN 60811-5-1:2000
-401, -412	BS EN 60811-1-2:1995
-402, -502, -503, -606	BS EN 60811-1-3:1995
-403, -404, -507	BS EN 60811-2-1:1998
-405, -409	BS EN 60811-3-2:1995
-406, -511, -605, -607	BS EN 60811-4-1:2004
-407, -408, -410, -510, -512, -513	BS EN 60811-4-2:2004
-504, -505, -506	BS EN 60811-1-4:1995
-508, -509	BS EN 60811-3-1:1995

Superseded standards are withdrawn

The UK participation in its preparation was entrusted by Technical Committee GEL/20, Electric cables, to Subcommittee GEL/20/17, Electric Cables - Low voltage.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Amendments issued since publication

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EUROPEAN STANDARD

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EN 60811-510

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ICS 29.035.01; 29.060.20

Supersedes EN 60811-4-2:2004 (partially)

English version

Electric and optical fibre cables - Test methods for non-metallic materials - Part 510: Mechanical tests - Methods specific to polyethylene and polypropylene compounds - Wrapping test after thermal ageing in air

(IEC 60811-510:2012)

Câbles électriques et câbles à fibres optiques - Méthodes d'essai pour les matériaux non-métalliques - Partie 510: Essais mécaniques - Méthodes spécifiques pour les mélanges polyéthylène et polypropylène - Essai d'enroulement après vieillissement thermique dans l'air
(CEI 60811-510:2012)

Kabel, isolierte Leitungen und Glasfaserkabel - Prüfverfahren für nichtmetallene Werkstoffe - Teil 510: Mechanische Prüfungen - Verfahren speziell für Polyethylen- und Polypropylenmischungen - Wickelprüfung nach thermischer Alterung in Luft
(IEC 60811-510:2012)

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

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Foreword

The text of document 20/1306/FDIS, future edition 1 of IEC 60811-510, prepared by IEC/TC 20 "Electric cables" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60811-510:2012.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2013-01-17
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2015-04-17

This document supersedes Clause 10 of EN 60811-4-2:2004 (partially). Full details of the replacements are shown in Annex A of EN 60811-100:2012.

There are no specific technical changes with respect to EN 60811-4-2:2004, but see the Foreword to EN 60811-100:2012.

This standard is to be read in conjunction with EN 60811-100.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

Endorsement notice

The text of the International Standard IEC 60811-510:2012 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated :

IEC 60811-4-2:2004	NOTE	Harmonized as EN 60811-4-2:2004 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60811-100	2012	Electric and optical fibre cables - Test methods for non-metallic materials - Part 100: General	EN 60811-100	2012

CONTENTS

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.

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

Part 510: Mechanical tests – Methods specific to polyethylene and polypropylene compounds – Wrapping test after thermal ageing in air

1 Scope

This Part 510 of IEC 60811 specifies the test method for a wrapping test after thermal ageing in air. This test method applies specifically to polyolefin insulation in communication cables.

This test is intended for polyolefin insulations of unfilled cables and of dry cores for filled cables, where the insulation has a wall thickness of less than or equal to 0,8 mm.

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

3 Terms and definitions

For the purposes of this document, the 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.

All the tests shall be carried out not less than 16 h after the extrusion or cross-linking, if any, of the compounds used for insulating or sheathing.

4.2 Apparatus

The apparatus consists of the following parts:

– a smooth metal mandrel and loading elements;
– a winding device, preferably with mechanically driven mandrel;
– an electrically heated cabinet with natural air flow.

4.3 Sampling

The test shall be carried out on four test pieces for each length of cable or core to be tested.

Take a sample 2 m long and cut it into four test pieces of equal length.

Carefully remove the coverings and braidings, if any, from the test pieces and any filling compound which may adhere to the cores.

Leave the conductor within the insulation. Then straighten the test pieces.

4.4 Ageing procedure

The test pieces prepared in accordance with 4.3 shall be suspended vertically for 14 × 24 h at (100 ± 2) °C in the middle of the heating chamber in accordance with 4.2 so that each test piece is at least 20 mm from any other test piece. Not more than 2 % of the chamber volume shall be occupied by the test pieces. Immediately after the ageing period, the test pieces shall be taken out of the chamber and left at ambient temperature, without being exposed to direct sunlight, for at least 16 h.

NOTE The ageing time and/or ageing temperature may be increased if required by the relevant cable specifications.

4.5 Test procedure

4.5.1 Test pieces according to 4.3 shall be subjected, after ageing in accordance with 4.4, to a winding test at ambient temperature.

4.5.2 The conductor shall be laid bare at one end. A weight shall be applied to the exposed conductor end, exerting a pull of 15 N/mm^2 ± 20 % with respect to the conductor cross-section. Ten windings shall be made on the other end of the test piece by means of a winding device in accordance with 4.2 on a metal mandrel at a speed of about 1 revolution per 5 s.

The winding diameter shall be 1 to 1,5 times the test piece diameter. Subsequently, the test pieces wound on the mandrel shall be removed from the latter and shall be kept in their helical form for 24 h at (70 ± 2) °C in the vertical position, substantially in the middle of the heating chamber in accordance with 4.2.

4.6 Evaluation of results

After cooling down to ambient temperature, the test pieces shall show no cracks when examined with normal or corrected vision without magnification. The test may be repeated once more if a test piece fails.

5 Test report

The test report shall be in accordance with that given in IEC 60811-100.

Bibliography

IEC 608011-4-2:2004, *Insulating and sheathing materials of electric and optical cables – Common test methods – Part 4-2: Methods specific to polyethylene and polypropylene compounds – Tensile strength and elongation at break after conditioning at elevated temperature – Wrapping test after conditioning at elevated temperature – Wrapping test after thermal ageing in air – Measurement of mass increase – Long-term stability test – Test method for copper-catalyzed oxidative degradation*
(withdrawn)

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