



NSAI
Standards

Irish Standard
I.S. EN 60811-410:2012&A1:2017

Electric and optical fibre cables - Test methods for non-metallic materials - Part 410: Miscellaneous tests - Test method for copper-catalyzed oxidative degradation of polyolefin insulated conductors

I.S. EN 60811-410:2012&A1:2017

Incorporating amendments/corrigenda/National Annexes issued since publication:

EN 60811-410:2012/A1:2017

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National Foreword

I.S. EN 60811-410:2012&A1:2017 is the adopted Irish version of the European Document EN 60811-410:2012, Electric and optical fibre cables - Test methods for non-metallic materials - Part 410: Miscellaneous tests - Test method for copper-catalyzed oxidative degradation of polyolefin insulated conductors

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 60811-410:2012/A1

November 2017

ICS 29.035.01; 29.060.20

English Version

**Electric and optical fibre cables - Test methods for non-metallic materials - Part 410: Miscellaneous tests - Test method for copper-catalyzed oxidative degradation of polyolefin insulated conductors
(IEC 60811-410:2012/A1:2017)**

Câbles électriques et à fibres optiques - Méthodes d'essai pour les matériaux non-métalliques - Partie 410: Essais divers - Méthode d'essai pour la mesure de la dégradation par oxydation catalytique par le cuivre des conducteurs isolés aux polyoléfinés
(IEC 60811-410:2012/A1:2017)

Kabel, isolierte Leitungen und Glasfaserkabel - Prüfverfahren für nichtmetallene Werkstoffe - Teil 410: Sonstige Prüfungen - Prüfverfahren für die Sauerstoffalterung unter Kupfereinfluss für polyolefinisolierte Leiter
(IEC 60811-410:2012/A1:2017)

This amendment A1 modifies the European Standard EN 60811-410:2012; it was approved by CENELEC on 2017-08-25. 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.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN 60811-410:2012/A1:2017

European foreword

The text of document 20/1734/FDIS, future IEC 60811-410:2012/A1, prepared by IEC/TC 20 "Electric cables" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60811-410:2012/A1:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at (dop) 2018-05-25
national level by publication of an identical national
standard or by endorsement
- latest date by which the national standards conflicting with (dow) 2020-08-25
the document have to be withdrawn

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The text of the International Standard IEC 60811-410:2012/A1:2017 was approved by CENELEC as a European Standard without any modification.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60811-410

June 2012

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 410: Miscellaneous tests -
Test method for copper-catalyzed oxidative degradation of polyolefin
insulated conductors
(IEC 60811-410:2012)**

Câbles électriques et à fibres optiques -
Méthodes d'essai pour les matériaux non-
métalliques -
Partie 410: Essais divers -
Méthode d'essai pour la mesure de la
dégradation par oxydation catalytique par
le cuivre des conducteurs isolés aux
polyoléfines
(CEI 60811-410:2012)

Kabel, isolierte Leitungen und
Glasfaserkabel -
Prüfverfahren für nichtmetallene
Werkstoffe -
Teil 410: Sonstige Prüfungen -
Prüfverfahren für die Sauerstoffalterung
unter Kupfereinfluss für polyolefinisolierte
Leiter
(IEC 60811-410:2012)

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

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Foreword

The text of document 20/1294/FDIS, future edition 1 of IEC 60811-410, prepared by IEC/TC 20 "Electric cables" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60811-410:2012.

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) 2013-01-16
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-04-16

This document supersedes Annex B 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 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.

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

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Annex ZA (normative)

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

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

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IEC 60811-410

Edition 1.0 2012-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electric and optical fibre cables – Test methods for non-metallic materials –
Part 410: Miscellaneous tests – Test method for copper-catalyzed oxidative
degradation of polyolefin insulated conductors**

**Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux
non-métalliques –
Partie 410: Essais divers – Méthode d'essai pour la mesure de la dégradation
par oxydation catalytique par le cuivre des conducteurs isolés aux polyoléfinés**



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IEC 60811-410

Edition 1.0 2012-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electric and optical fibre cables – Test methods for non-metallic materials –
Part 410: Miscellaneous tests – Test method for copper-catalyzed oxidative
degradation of polyolefin insulated conductors**

**Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux
non-métalliques –
Partie 410: Essais divers – Méthode d'essai pour la mesure de la dégradation
par oxydation catalytique par le cuivre des conducteurs isolés aux polyoléfinés**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 410: Miscellaneous tests – Test method for copper-catalyzed oxidative degradation of polyolefin insulated conductors

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 60811-410 has been prepared by IEC technical committee 20: Electric cables.

This Part 410 of IEC 60811 cancels and replaces Annex B of IEC 60811-4-2:2004, 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
20/1294/FDIS	20/1343/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 used 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.

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 410: Miscellaneous tests – Test method for copper-catalyzed oxidative degradation of polyolefin insulated conductors

1 Scope

This Part 410 of IEC 60811 gives the procedure for copper-catalyzed oxidative degradation of a polyolefin, which is typically used for insulation in communication cables.

Full test conditions, such as temperature, duration, etc. and full test requirements are not specified in this standard; it is intended that they should be specified by the standard dealing with the relevant type of cable.

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 terms and definitions given in IEC 60811-100 apply.

4 Test method

4.1 General

The need for a manufacturer to monitor his cable production to ensure that it has adequate resistance to oxidation is well established. The Oxidation Induction Time (OIT) test has been found suitable for monitoring both raw materials and cables for compliance with this requirement, once suitable materials have been selected. The OIT test is not suitable for the selection of materials. For this purpose, long-term thermal ageing tests are preferred.

4.2 Apparatus

For the purposes of this test, the different equipment used is as follows:

- a) A differential thermal analyser or differential scanning calorimeter, capable of heating at rates of up to at least (20 ± 1) K/min and maintaining the test temperature isothermally within 0,2 K and of automatic recording of differences in temperature (or differences in heat transfer) between the sample and a reference material to the required sensitivity and precision.
- b) A recorder capable of displaying heat flow or temperature difference on the Y-axis, and time on the X-axis. The time base shall be accurate to ± 1 % and be readable to 0,1 min.
- c) A gas-selector switch and regulators for high-purity nitrogen and oxygen.

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