



**NSAI**  
Standards

Irish Standard  
I.S. EN 60811-409:2012

Electric and optical fibre cables - Test methods for non-metallic materials -- Part 409: Miscellaneous tests - Loss of mass test for thermoplastic insulations and sheaths (IEC 60811-409:2012 (EQV))

## I.S. EN 60811-409:2012

*Incorporating amendments/corrigenda issued since publication:*

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

<p><i>This document replaces:</i> EN 60811-3-2:1995 (partially) + A2:2004 (partially)</p>	<p><i>This document is based on:</i> EN 60811-409:2012</p>	<p><i>Published:</i> 15 June, 2012</p>
<p>This document was published under the authority of the NSAI and comes into effect on:</p> <p>20 June, 2012</p>		<p>ICS number: 29.035.01 29.060.20</p>
<p><b>NSAI</b> 1 Swift Square, Northwood, Santry Dublin 9</p>	<p>T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie  W NSAI.ie</p>	<p><b>Sales:</b> T +353 1 857 6730 F +353 1 857 6729 W standards.ie</p>
<p>Údarás um Chaighdeáin Náisiúnta na hÉireann</p>		

EUROPEAN STANDARD

**EN 60811-409**

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2012

ICS 29.035.01; 29.060.20

Supersedes EN 60811-3-2:1995 (partially) + A2:2004 (partially)

English version

**Electric and optical fibre cables -  
Test methods for non-metallic materials -  
Part 409: Miscellaneous tests -  
Loss of mass test for thermoplastic insulations and sheaths  
(IEC 60811-409:2012)**

Câbles électriques et à fibres optiques -  
Méthodes d'essai pour les matériaux non-  
métalliques -  
Partie 409: Essais divers -  
Essai de perte de masse des enveloppes  
isolantes et gaines thermoplastiques  
(CEI 60811-409:2012)

Kabel, isolierte Leitungen und  
Glasfaserkabel -  
Prüfverfahren für nichtmetallene  
Werkstoffe -  
Teil 409: Sonstige Prüfungen -  
Prüfung des Masseverlusts von  
Isolierhüllen und Mänteln  
(IEC 60811-409:2012)

This European Standard was approved by CENELEC on 2012-04-16. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**CENELEC**

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

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

**I.S. EN 60811-409:2012**

EN 60811-409:2012

- 2 -

**Foreword**

The text of document 20/1293/FDIS, future edition 1 of IEC 60811-409, prepared by IEC/TC 20 "Electric cables" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60811-409:2012.

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 Clause 8 of EN 60811-3-2:1995 + A2:2004 (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 60811-3-2:1995 + A2:2004, 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 60811-409:2012 was approved by CENELEC as a European Standard without any modification.

## 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.

<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
IEC 60811-201	2012	Electric and optical fibre cables - Test methods for non-metallic materials - Part 201: General tests - Measurement of insulation thickness	EN 60811-201	2012
IEC 60811-202	2012	Electric and optical fibre cables - Test methods for non-metallic materials - Part 202: General tests - Measurement of thickness of non-metallic sheath	EN 60811-202	2012
IEC 60811-401	2012	Electric and optical fibre cables - Test methods for non-metallic materials - Part 401: Miscellaneous tests - Thermal ageing methods - Ageing in an air oven	EN 60811-401	2012
IEC 60811-501	2012	Electric and optical fibre cables - Test methods for non-metallic materials - Part 501: Mechanical tests - Tests for determining the mechanical properties of insulating and sheathing compounds	EN 60811-501	2012

*This page is intentionally left BLANK.*

## CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 Loss of mass test for insulation .....	6
4.1 General.....	6
4.2 Test equipment .....	6
4.3 Sample and test pieces preparation.....	7
4.4 Test procedure .....	7
4.5 Measurements.....	8
4.6 Expression of results.....	8
5 Test report.....	8
6 Loss of mass test for sheaths .....	8
6.1 General.....	8
6.2 Test equipment .....	8
6.3 Sample and test pieces preparation.....	8
6.4 Test procedure .....	8
6.5 Measurements.....	8
6.6 Expression of results.....	9
7 Test report.....	9
Annex A (normative) Calculation of the evaporation area .....	10
Bibliography.....	13
Figure A.1 – Dumb-bell test piece .....	11
Figure A.2 – Small dumb-bell test piece.....	11
Figure A.3 – Measurement of insulation thickness (stranded conductor) .....	12
Figure A.4 – Measurement of thickness (uneven outer circular profile).....	12
Figure A.5 – Measurement of sheath thickness (irregular inner circular profile).....	12

INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

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

**Part 409: Miscellaneous tests –  
Loss of mass test for thermoplastic insulations and sheaths**

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60811-409 has been prepared by IEC technical committee 20: Electric cables.

This Part 409 of IEC 60811 cancels and replaces Clause 8 of IEC 60811-3-2:1985, 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
20/1293/FDIS	20/1342/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.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-