



National Standards Authority of Ireland

STANDARD

I.S. EN 60811-4-1:2004

ICS 29.035.20  
29.060.20

**INSULATING AND SHEATHING MATERIALS  
OF ELECTRIC AND OPTICAL CABLES -  
COMMON TEST METHODS PART 4-1:  
METHODS SPECIFIC TO POLYETHYLENE  
AND POLYPROPYLENE COMPOUNDS -  
RESISTANCE TO ENVIRONMENTAL STRESS  
CRACKING - MEASUREMENT OF THE MELT  
FLOW INDEX - CARBON BLACK AND/OR  
MINERAL FILLER CONTENT MEASUREMENT  
IN POLYETHYLENE BY DIRECT COMBUSTION  
- ASSESSMENT OF CARBON BLACK  
DISPERSION IN POLYETHYLENE USING A  
MICROSCOPE (IEC 60811-4-1:2004)**

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EUROPEAN STANDARD

**EN 60811-4-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2004

ICS 29.035.20; 29.060.20

Supersedes EN 60811-4-1:1995

English version

**Insulating and sheathing materials of electric and optical cables –  
Common test methods**

**Part 4-1: Methods specific to polyethylene and polypropylene compounds - Resistance to environmental stress cracking - Measurement of the melt flow index - Carbon black and/or mineral filler content measurement in polyethylene by direct combustion - Measurement of carbon black content by thermogravimetric analysis (TGA) - Assessment of carbon black dispersion in polyethylene using a microscope (IEC 60811-4-1:2004)**

Matériaux d'isolation et de gainage des câbles électriques et optiques - Méthodes d'essais communes  
Partie 4-1: Méthodes spécifiques pour les mélanges polyéthylène et polypropylène - Résistance aux craquelures sous contraintes dues à l'environnement - Mesure de l'indice de fluidité à chaud - Mesure dans le polyéthylène du taux de noir de carbone et/ou des charges minérales par méthode de combustion directe - Mesure du taux de noir de carbone par analyse thermogravimétrique - Evaluation de la dispersion du noir de carbone dans le polyéthylène au moyen d'un microscope  
(CEI 60811-4-1:2004)

Isolier- und Mantelwerkstoffe für Kabel und isolierte Leitungen - Allgemeine Prüfverfahren  
Teil 4-1: Besondere Verfahren für Polyethylen- und Polypropylen-Verbindungen - Spannungsrißbeständigkeit - Messung des Schmelzindexes - Bestimmung des Ruß- und/oder Füllstoffgehaltes in Polyethylen durch direkte Verbrennung - Bestimmung des Rußgehaltes durch thermogravimetrische Analyse (TGA) - Bewertung der Rußverteilung in Polyethylen unter Verwendung eines Mikroskops  
(IEC 60811-4-1:2004)

This European Standard was approved by CENELEC on 2004-07-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

**CENELEC**

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

The text of document 20/687/FDIS, future edition 2 of IEC 60811-4-1, prepared by IEC TC 20, Electric cables, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60811-4-1 on 2004-07-01.

This European Standard supersedes EN 60811-4-1:1995.

The principal changes with respect to EN 60811-4-1:1995 are:

- a) the wrapping test after thermal ageing in air is deleted from this part of EN 60811. It is now given only in EN 60811-4-2;
- b) a thermogravimetric method is added for determination of carbon black content;
- c) a method is introduced for assessment of carbon black dispersion.

The following dates were fixed:

- |  |       |            |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2005-04-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn   | (dow) | 2007-07-01 |

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 60811-4-1:2004 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

- |               |      |   |
|---------------|------|---|
| IEC 60811-4-2 | NOTE | Harmonized as EN 60811-4-2:2004 (not modified). |
| ISO 1133      | NOTE | Harmonized as EN ISO 1133:1997 (not modified).  |
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## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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

NOTE Where 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 60811-1-3	1993	Insulating and sheathing materials of electric and optical cables - Common test methods Part 1-3: General application - Methods for determining the density - Water absorption tests - Shrinkage test	EN 60811-1-3	1995
ISO 18553	2002	Method for the assesment of the degree of pigment or carbon black dispersion in polyolefin pipes, fittings and compounds	-	-

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**Partie 4-1:**

**Méthodes spécifiques pour les mélanges polyéthylène et  
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