SLOVENSKI STANDARD

SIST EN 60811-4-2:2005

april 2005

Materiali za izoliranje in oplaščenje električnih in optičnih kablov – Splošne preskusne metode – 4-2. del: Posebne metode za polietilenske in polipropilenske mase – Natezna trdnost in raztezek pri pretrganju po kondicioniranju pri povišanih temperaturah – Preskus ovijanja po kondicioniranju pri povišanih temparaturah po staranju v zraku – Meritev povečanja mase – Preskus dolgotranje stabilnosti – Preskusna metoda za oksidativno razgradnjo, katalizirano z bakrom (IEC 60811-4-2:2004)

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 temparature – Wrapping test after thermal ageing in air – Measurement of mass increase – Long-term stability test – Test method for copper-catalyzed oxidative degradation microscope (IEC 60811-4-2:2004)

ICS 29.035.20; 29.060.20

Referenčna številka
SIST EN 60811-4-2:2005(en)

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60811-4-2

August 2004

ICS 29.035.20; 29.060.20

Supersedes EN 60811-4-2:1999

English version

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

(IEC 60811-4-2:2004)

Matériaux d'isolation et de gainage des câbles électriques et optiques - Méthodes d'essai communes
Partie 4-2: Méthodes spécifiques pour les mélanges polyéthylène et polypropylène - Résistance à la traction et allongement à la rupture après conditionnement à température élevée - Essai d'enroulement après conditionnement à température élevée - Essai d'enroulement après vieillissement thermique dans l'air - Mesure de l'augmentation de masse - Essai de stabilité à long terme - Méthode d'essai pour l'oxydation catalytique par le cuivre
(CEI 60811-4-2:2004)

Isolier- und Mantelwerkstoffe für Kabel und isolierte Leitungen - Allgemeine Prüfverfahren
Teil 4-2: Besondere Prüfverfahren für Polyethylen- und Polypropylen-Mischungen - Zugfestigkeit und Reißdehnung nach Vorbehandlung bei erhöhter Temperatur - Wickelprüfung nach Vorbehandlung bei erhöhter Temperatur - Wickelprüfung nach thermischer Alterung in Luft - Messung der Masseaufnahme - Langzeit(Lebensdauer)-Prüfung - Prüfverfahren der Sauerstoffalterung unter Kupfereinfluss
(IEC 60811-4-2:2004)

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

Ref. No. EN 60811-4-2:2004 E

Foreword

The text of document 20/686/FDIS, future edition 2 of IEC 60811-4-2, prepared by IEC TC 20, Electric cables, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60811-4-2 on 2004-07-01.

This European Standard supersedes EN 60811-4-2:1999.

The principal changes with respect to EN 60811-4-2:1999 are:

a) a measurement of tensile strength is included in Clause 8;

b) Clause 10 is now the only method in EN 60811 for the wrapping test after thermal ageing in air;

c) two ageing conditions are now specified for the long-term stability test in Annex A.

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.

Endorsement notice

The text of the International Standard IEC 60811-4-2:2004 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 60811-5-1 NOTE Harmonized as EN 60811-5-1:1999 (modified).

_____

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.

Publication	Year	Title	EN/HD	Year
IEC 60811-1-1	1993	Insulating and sheathing materials of electric and optical cables - Common test methods Part 1-1: General application - Measurement of thickness and overall dimensions - Tests for determining the mechanical properties	EN 60811-1-1	1995
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 188	1998	Rubber, vulcanized or thermoplastic - Accelerated ageing and heat resistance tests	-	-

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI IEC 60811-4-2

Deuxième édition
Second edition
2004-05

Matériaux d'isolation et de gainage des câbles électriques et optiques – Méthodes d'essais communes –

Partie 4-2:

Méthodes spécifiques pour les mélanges polyéthylène et polypropylène – Résistance à la traction et allongement à la rupture après conditionnement à température élevée – Essai d'enroulement après conditionnement à température élevée – Essai d'enroulement après vieillissement thermique dans l'air – Mesure de l'augmentation de masse – Essai de stabilité à long terme – Méthode d'essai pour l'oxydation catalytique par le cuivre

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

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

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International Standard IEC 60811-4-2 has been prepared by IEC technical committee 20: Electric cables.

This second edition cancels and replaces the first edition, published in 1990.

The principal changes with respect to the previous edition are listed below:

a) A measurement of tensile strength is included in Clause 8.
b) Clause 10 is now the only method in IEC 60811 for wrapping test after thermal ageing in air.
c) Two ageing conditions are now specified for the long-term stability test in Annex A.

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

FDIS	Report on voting
20/686/FDIS	20/695/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.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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

1 General

1.1 Scope

This part of IEC 60811 specifies the test methods for testing polymeric insulating and sheathing materials of electric and optical fibre cables for power distribution and communications, including cables used on ships and in offshore applications. These test methods apply specifically to polyolefin insulation and sheath.

1.2 Normative references

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.

IEC 60811-1-1:1993, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section 1: Measurement of thickness and overall dimensions – Tests for determining the mechanical properties*

IEC 60811-1-3:1993, *Insulating and sheathing materials of electric and optical cables – Part 1: General application – Section 3: Methods for determining the density – Water absorption tests – Shrinkage test*

ISO 188, *Rubber, vulcanized or thermoplastic – Accelerated ageing and heat-resistance tests*

2 Terms and definitions

For the purposes of this standard, a distinction is made between low density, medium density and high-density PE as shown below:

Type of polyethylene	Density at 23 °C[a] g/cm^3
Low-density polyethylene	≤ 0,925
Medium-density polyethylene	>0,925 ≤ 0,940
High-density polyethylene	> 0,940

[a] These densities refer to unfilled resins, as determined by the method specified in Clause 8 of IEC 60811-1-3.