

## REDLINE VERSION



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**Optical fibre cables –  
Part 4: Sectional specification – Aerial optical cables along electrical power  
lines**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## CONTENTS

1	Scope.....	6
2	Normative references.....	6
3	Terms, definitions, symbols and <del>abbreviations of cables</del> abbreviated terms.....	8
	<del>Definitions.....</del>	
	<del>Abbreviations of cables.....</del>	
4	Optical fibre.....	9
4.1	General.....	9
4.2	Attenuation.....	9
4.2.1	Attenuation coefficient.....	9
4.2.2	Attenuation uniformity-attenuation discontinuities.....	9
4.3	Cut-off wavelength of cabled fibre.....	9
4.4	Fibre colouring.....	10
4.5	Polarization mode dispersion (PMD).....	10
5	Cable element.....	10
5.1	General.....	10
5.2	Slotted core.....	10
5.3	<del>Plastic</del> Polymeric tube.....	11
5.4	Ribbon.....	11
5.5	Metallic tube.....	11
5.5.1	General.....	11
5.5.2	Metallic tube on the optical core.....	11
5.5.3	Fibres directly located in a metallic tube.....	12
6	Optical fibre cable construction.....	12
6.1	General.....	12
6.2	Lay-up of the cable elements.....	12
6.3	Cable core filling.....	13
6.4	Strength members.....	13
6.4.1	General.....	13
6.4.2	OPGW, OPPC and MASS.....	13
6.4.3	ADSS and OPAC.....	14
6.5	Cable sheath (ADSS and OPAC).....	14
6.5.1	Inner sheath.....	14
6.5.2	Outer sheath.....	14
6.6	Sheath marking.....	15
7	<del>Main requirements for installation and operating conditions</del> Characterization of cable elements.....	15
	<del>General.....</del>	
	<del>Characterization of optical units for splicing purpose.....</del>	
8	Design characteristics.....	16
9	Optical fibre cable tests.....	16
9.1	General.....	16
	<del>Classification of tests.....</del>	
	<del>Type tests.....</del>	
	<del>Sample tests.....</del>	
	<del>Routine tests.....</del>	

9.2	Tensile performance.....	18
9.3	Stress-strain test on metallic cables.....	18
	<del>Installation capability.....</del>	
9.4	Sheave test.....	19
	<del>Repeated bending.....</del>	
	<del>Impact.....</del>	
	<del>Crush.....</del>	
	<del>Kink.....</del>	
	<del>Torsion.....</del>	
	<del>Temperature cycling.....</del>	
9.5	Short-circuit.....	19
9.6	Lightning test.....	20
9.7	Ageing.....	20
9.8	Fibre coating compatibility.....	20
	<del>Finished cable.....</del>	
9.9	Hydrogen gas.....	20
9.10	Aeolian vibration.....	20
9.11	Creep.....	20
9.12	Fitting compatibility.....	20
	<del>Water penetration (for filled cables only).....</del>	
	<del>Bleeding (for filled cables only).....</del>	
9.13	Grease.....	21
9.14	Attenuation.....	21
9.15	Tracking and erosion resistance test on ADSS and OPAC.....	21
9.16	<del>Weathering</del> UV resistance test on ADSS and OPAC.....	21
9.17	Shotgun resistance test on ADSS and OPAC.....	21
9.18	Conductor access trolley for OPAC.....	21
10	Quality assurance.....	21
11	Packaging.....	21
	Annex A (informative normative) Recommended methods of calculating rated tensile strength, cross-section of a layer of trapezoidal shaped wires, modulus of elasticity, linear expansion and DC resistance for OPGW, OPPC and MASS.....	23
A.1	Calculation of rated tensile strength (RTS).....	23
A.2	Calculation of the cross-sectional area of a layer of trapezoidal or Z- shaped wires.....	23
A.3	Calculation of the final modulus of elasticity ( $E$ ).....	23
A.4	Calculation of coefficient of linear expansion ( $\beta$ ).....	24
A.5	Calculation of DC resistance.....	24
	Bibliography.....	25
	Table 1 – Characteristics of different types of cable elements.....	15
	Table 2 – Design characteristics.....	16
	Table 3 – Mechanical and environmental applicable tests.....	17

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### OPTICAL FIBRE CABLES –

#### Part 4: Sectional specification – Aerial optical cables along electrical power lines

#### 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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**This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.**

International Standard IEC 60794-4 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee TC 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2003. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the specification has been streamlined by cross-referencing IEC 60794-1-1;
- b) the classification as type tests or routine tests has been deleted;
- c) cable kink test has been deleted;
- d) creep test for ADSS is referred to IEC 60794-4-20.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
86A/1862/FDIS	86A/1868/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60794 series, published under the general title *Optical fibre cables*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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## OPTICAL FIBRE CABLES –

### Part 4: Sectional specification – Aerial optical cables along electrical power lines

#### 1 Scope

~~This part of IEC 60794 specifies the electrical, mechanical and optical requirements and test methods for aerial optical cables including OPGW (optical ground wire), OPPC (optical phase conductor), MASS (metallic aerial self-supported cable), ADSS (all-dielectric self-supporting cable) and OPAC (optical attached cable).~~

This part of IEC 60794 covers cable construction, test methods, optical, mechanical, environmental and electrical performance requirements for aerial optical fibre cables and cable elements which are intended to be used along power lines (OCEPL) as a high bandwidth transport media for communications and control optical signals, including optical ground wires (OPGW), optical phase conductors (OPPC), metallic aerial self-supported cables (MASS), all-dielectric self-supporting cables (ADSS) and optical attached cables (OPAC).

This document excludes figure-8 optical cables to be used on telephone utility poles.

The IEC TR 62839-1 gives recommendations to provide the customer with the environmental declaration on request.

#### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

~~They complete the normative references already listed in the generic specification (IEC 60794-1-1, Clause 2, and IEC 60794-1-2, Clause 2) and in the sectional specification (IEC 60794-3, Clause 2).~~

IEC 60104:1987, *Aluminium-magnesium-silicon alloy wire for overhead line conductors*

IEC 60304:1982, *Standard colours for insulation for low-frequency cables and wires*

~~IEC 60708-1:1981, *Low-frequency cables with polyolefin insulation and moisture barrier polyolefin sheath – Part 1: General design details and requirements*~~

IEC 60793-1-21, *Optical fibres – Part 1-21: Measurement methods and test procedures – Coating geometry*

IEC 60793-1-32, *Optical fibres – Part 1-32: Measurement methods and test procedures – Coating strippability*

IEC 60793-1-40, *Optical fibres – Part 1-40: Measurement methods and test procedures – Attenuation*

IEC 60793-1-44, *Optical fibres – Part 1-44: Measurement methods and test procedures – Cut-off wavelength*

IEC 60793-1-48, *Optical fibres – Part 1-48: Measurement methods and test procedures – Polarization mode dispersion*

IEC 60793-2, *Optical fibres – Part 2: Product specifications – General*

IEC 60794-1-1, *Optical fibre cables – Part 1-1: Generic specification – General*

IEC 60794-1-21, *Optical fibre cables – Part 1-21: Generic specification – Basic optical cable test procedures – Mechanical tests methods*

IEC 60794-1-22, *Optical fibre cables – Part 1-22: Generic specification – Basic optical cable test procedures – Environmental tests methods*

IEC 60794-1-23, *Optical fibre cables – Part 1-23: Generic specification – Basic optical cable test procedures – Cable element test methods*

IEC 60794-1-24, *Optical fibre cables – Part 1-24: Generic specification – Basic optical cable test procedures – Electrical test methods*

IEC 60794-3:~~2004~~, *Optical fibre cables – Part 3: Outdoor cables – Sectional specification*

IEC 60794-4-20:2012, *Optical fibre cables – Part 4-20: Aerial optical cables along power lines – Family specification for ADSS (All Dielectric Self Supported) optical cables*

~~IEC 60811-4-2:1990, Common test methods for insulating and sheathing materials of electric cables – Part 4: Methods specific to polyethylene and polypropylene compounds – Section Two: Elongation at break after pre-conditioning – Wrapping test after pre-conditioning – Wrapping test after thermal ageing in air – Measurement of mass increase – Long term stability test (Appendix A) – Test method for copper-catalysed oxidative degradation (Appendix B)~~

~~IEC 60811-5-1:1990, Common test methods for insulating and sheathing materials of electric cables – Part 5: Methods specific to filling compounds – Section one: Drop point – Separation of oil – Lower temperature brittleness – Total acid number – Absence of corrosive components – Permittivity at 23 °C – DC resistivity at 23 °C and 100 °C~~

IEC 60811-202, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 202: General tests – Measurement of thickness of non-metallic sheath*

IEC 60811-203, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 203: General tests – Measurement of overall dimensions*

IEC 60811-401, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 401: Miscellaneous tests – Thermal ageing methods – Ageing in an air oven*

IEC 60811-406, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 406: Miscellaneous tests – Resistance to stress cracking of polyethylene and polypropylene compounds*

IEC 60811-501, *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*

IEC 60811-604:2012, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 604: Physical tests – Measurement of absence of corrosive components in filling compounds*

IEC 60811-607, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 607: Physical tests – Test for the assessment of carbon black dispersion in polyethylene and polypropylene*

IEC 60888:~~1987~~, *Zinc-coated steel wires for stranded conductors*

IEC 60889:~~1987~~, *Hard-drawn aluminium wire for overhead line conductors*

IEC 61089:1991, *Round wire concentric lay overhead electrical stranded conductors*

IEC 61232:~~1993~~, *Aluminium-clad steel wires for electrical purposes*

IEC 61394:~~1997~~, *Overhead lines – ~~Characteristics of~~ Requirements for greases for aluminium, aluminium alloy and steel bare conductors*

IEC 61395:~~1998~~, *Overhead electrical conductors – Creep test procedures for stranded conductors*



# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

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**Optical fibre cables –**

**Part 4: Sectional specification – Aerial optical cables along electrical power lines**

**Câbles à fibres optiques –**

**Partie 4: Spécification intermédiaire – Câbles optiques aériens le long des lignes électriques de transport d'énergie**



## CONTENTS

FOREWORD .....	4
1 Scope .....	6
2 Normative references .....	6
3 Terms, definitions, symbols and abbreviated terms .....	8
4 Optical fibre .....	8
4.1 General .....	8
4.2 Attenuation .....	8
4.2.1 Attenuation coefficient .....	8
4.2.2 Attenuation uniformity-attenuation discontinuities .....	8
4.3 Cut-off wavelength of cabled fibre .....	8
4.4 Fibre colouring .....	8
4.5 Polarization mode dispersion (PMD) .....	8
5 Cable element .....	8
5.1 General .....	8
5.2 Slotted core .....	9
5.3 Polymeric tube .....	9
5.4 Ribbon .....	10
5.5 Metallic tube .....	10
5.5.1 General .....	10
5.5.2 Metallic tube on the optical core .....	10
5.5.3 Fibres directly located in a metallic tube .....	10
6 Optical fibre cable construction .....	10
6.1 General .....	10
6.2 Lay-up of the cable elements .....	11
6.3 Cable core filling .....	11
6.4 Strength members .....	11
6.4.1 General .....	11
6.4.2 OPGW, OPPC and MASS .....	11
6.4.3 ADSS and OPAC .....	12
6.5 Cable sheath (ADSS and OPAC) .....	12
6.5.1 Inner sheath .....	12
6.5.2 Outer sheath .....	12
6.6 Sheath marking .....	13
7 Characterization of cable elements .....	13
8 Design characteristics .....	14
9 Optical fibre cable tests .....	14
9.1 General .....	14
9.2 Tensile performance .....	16
9.3 Stress-strain test on metallic cables .....	16
9.4 Sheave test .....	16
9.5 Short-circuit .....	16
9.6 Lightning test .....	16
9.7 Ageing .....	16
9.8 Fibre coating compatibility .....	17
9.9 Hydrogen gas .....	17

9.10	Aeolian vibration .....	17
9.11	Creep.....	17
9.12	Fitting compatibility .....	17
9.13	Grease.....	17
9.14	Attenuation .....	17
9.15	Tracking and erosion resistance test on ADSS and OPAC .....	17
9.16	UV resistance test on ADSS and OPAC .....	17
9.17	Shotgun resistance test on ADSS and OPAC .....	18
9.18	Conductor access trolley for OPAC .....	18
10	Quality assurance.....	18
11	Packaging .....	18
Annex A (normative) Recommended methods of calculating rated tensile strength, cross-section of a layer of trapezoidal shaped wires, modulus of elasticity, linear expansion and DC resistance for OPGW, OPPC and MASS.....		
A.1	Calculation of rated tensile strength (RTS).....	19
A.2	Calculation of the cross-sectional area of a layer of trapezoidal or Z- shaped wires.....	19
A.3	Calculation of the final modulus of elasticity ( $E$ ) .....	19
A.4	Calculation of coefficient of linear expansion ( $\beta$ ) .....	20
A.5	Calculation of DC resistance .....	20
Bibliography.....		21
Table 1 – Characteristics of different types of cable elements .....		13
Table 2 – Design characteristics .....		14
Table 3 – Mechanical and environmental applicable tests .....		15

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IEC 61089:1991, *Round wire concentric lay overhead electrical stranded conductors*

IEC 61232, *Aluminium-clad steel wires for electrical purposes*

IEC 61394, *Overhead lines – Requirements for greases for aluminium, aluminium alloy and steel bare conductors*

IEC 61395, *Overhead electrical conductors – Creep test procedures for stranded conductors*

## SOMMAIRE

AVANT-PROPOS .....	24
1 Domaine d'application .....	26
2 Références normatives .....	26
3 Termes, définitions, symboles et termes abrégés .....	28
4 Fibres optiques .....	28
4.1 Généralités .....	28
4.2 Affaiblissement .....	28
4.2.1 Affaiblissement linéique .....	28
4.2.2 Uniformité de l'affaiblissement-discontinuité de l'affaiblissement.....	28
4.3 Longueur d'onde de coupure de fibre câblée.....	28
4.4 Couleurs des fibres .....	28
4.5 Dispersion de mode de polarisation .....	28
5 Élément de câble .....	29
5.1 Généralités .....	29
5.2 Jonc rainuré.....	29
5.3 Tube polymère .....	29
5.4 Ruban.....	30
5.5 Tube métallique .....	30
5.5.1 Généralités .....	30
5.5.2 Tube métallique sur le cœur optique.....	30
5.5.3 Fibres directement insérées dans un tube métallique.....	30
6 Construction d'un câble à fibres optiques .....	30
6.1 Généralités .....	30
6.2 Assemblage des éléments de câble .....	31
6.3 Remplissage du cœur du câble .....	31
6.4 Éléments de renfort .....	32
6.4.1 Généralités .....	32
6.4.2 Câbles de garde à fibres optiques (OPGW), conducteurs de phase à fibres optiques (OPPC) et câbles aériens métalliques autoporteurs (MASS).....	32
6.4.3 Câbles autoporteurs entièrement diélectriques (ADSS) et câbles optiques attachés (OPAC) .....	32
6.5 Gaine de câble (ADSS et OPAC) .....	32
6.5.1 Gaine intérieure.....	32
6.5.2 Gaine extérieure .....	32
6.6 Marquage de la gaine .....	33
7 Caractérisation des éléments de câble .....	34
8 Caractéristiques de conception.....	34
9 Essais sur les câbles à fibres optiques .....	35
9.1 Généralités .....	35
9.2 Performance en traction.....	37
9.3 Essai de contrainte-déformation sur les câbles métalliques.....	37
9.4 Essai de passage sur poulies.....	37
9.5 Court-circuit .....	37
9.6 Essai de choc de foudre.....	37
9.7 Vieillessement.....	38



9.8	Compatibilité du revêtement de la fibre .....	38
9.9	Hydrogène gazeux .....	38
9.10	Vibrations éoliennes .....	38
9.11	Fluage .....	38
9.12	Compatibilité des armatures .....	38
9.13	Graisse .....	38
9.14	Affaiblissement .....	38
9.15	Essai de résistance au cheminement et à l'érosion sur les ADSS et les OPAC .....	38
9.16	Essai de résistance aux UV sur les ADSS et les OPAC .....	39
9.17	Essai de tenue aux plombs de chasse sur les ADSS et les OPAC .....	39
9.18	Trolley d'accès conducteur pour OPAC .....	39
10	Assurance de la qualité .....	39
11	Conditionnement .....	39
Annexe A (normative) Méthodes recommandées pour le calcul de la résistance à la traction assignée, de la section droite d'une couche de brins de forme trapézoïdale, du module d'élasticité, de la dilatation linéaire et de la résistance en courant continu pour des OPGW, OPPC et MASS .....		40
A.1	Calcul de la résistance à la traction assignée .....	40
A.2	Calcul de la section droite d'une couche de brins de forme trapézoïdale ou profilés en Z .....	40
A.3	Calcul du module d'élasticité final ( $E$ ) .....	40
A.4	Calcul du coefficient de dilatation linéaire ( $\beta$ ) .....	41
A.5	Calcul de la résistance en courant continu .....	41
Bibliographie .....		42
Tableau 1 – Caractéristiques de différents types d'éléments de câble .....		34
Tableau 2 – Caractéristiques de conception .....		35
Tableau 3 – Essais mécaniques et d'environnement applicables .....		36

## COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

### CÂBLES À FIBRES OPTIQUES –

#### Partie 4: Spécification intermédiaire – Câbles optiques aériens le long des lignes électriques de transport d'énergie

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La Norme internationale IEC 60794-4 a été établie par le sous-comité 86A: Fibres et câbles, du comité d'études 86 de l'IEC: Fibres optiques.

Cette deuxième édition annule et remplace la première édition parue en 2003 dont elle constitue une révision technique.

La présente édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) la spécification a été simplifiée par des références croisées avec l'IEC 60794-1-1;
- b) la classification en essais de type ou en essais individuels de série a été supprimée;
- c) l'essai de pliure des câbles a été supprimé;

d) l'essai de fluage pour les câbles autoporteurs entièrement diélectriques fait référence à l'IEC 60794-4-20.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
86A/1862/FDIS	86A/1868/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 60794, publiées sous le titre général *Câbles à fibres optiques*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

## CÂBLES À FIBRES OPTIQUES –

### Partie 4: Spécification intermédiaire – Câbles optiques aériens le long des lignes électriques de transport d'énergie

#### 1 Domaine d'application

La présente partie de l'IEC 60794 couvre les exigences relatives à la construction de câbles, aux méthodes d'essai et aux performances optiques, mécaniques environnementales et électriques pour des câbles et des éléments de câbles optiques aériens destinés à être utilisés le long des lignes électriques de transport d'énergie (OCEPL: *optical cable to be used along electrical power lines*) comme support de transport à très large bande pour les signaux optiques de communication et de commande, comprenant les câbles de garde à fibres optiques (OPGW: *optical ground wire*), les conducteurs de phase à fibres optiques (OPPC: *optical phase conductor*), les câbles aériens métalliques autoporteurs (MASS: *metallic aerial self-supported cable*), les câbles autoporteurs entièrement diélectriques (ADSS: *all-dielectric self-supporting cable*) et les câbles optiques attachés (OPAC: *optical attached cable*).

Le présent document exclut les câbles optiques en forme de "8" utilisés sur les poteaux téléphoniques.

L'IEC TR 62839-1 donne des recommandations pour fournir une déclaration environnementale au client à sa demande.

#### 2 Références normatives

Les documents ci-après, dans leur intégralité ou non, sont des références normatives indispensables à l'application du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60104, *Fils en alliage d'aluminium-magnésium-silicium pour conducteurs de lignes aériennes*

IEC 60304, *Couleurs de référence de l'enveloppe isolante pour câbles et fils pour basses fréquences*

IEC 60793-1-21, *Fibres optiques – Partie 1-21: Méthodes de mesure et procédures d'essai – Géométrie du revêtement*

IEC 60793-1-32, *Fibres optiques – Partie 1-32: Mesures de mesure et procédures d'essai – Dénudabilité du revêtement*

IEC 60793-1-40, *Fibres optiques – Partie 1-40: Méthodes de mesure et procédures d'essai – Affaiblissement*

IEC 60793-1-44, *Fibres optiques – Partie 1-44: Méthodes de mesure et procédures d'essai – Longueur d'onde de coupure*

IEC 60793-1-48, *Fibres optiques – Partie 1-48: Méthodes de mesure et procédures d'essai – Dispersion de mode de polarisation*

IEC 60793-2, *Fibres optiques – Partie 2: Spécifications de produits – Généralités*

IEC 60794-1-1, *Câbles à fibres optiques – Partie 1-1: Spécification générique – Généralités*

IEC 60794-1-21, *Optical fibre cables – Part 1-21: Generic specification – Basic optical cable test procedures – Mechanical tests methods* (disponible en anglais seulement)

IEC 60794-1-22, *Optical fibre cables – Part 1-22: Generic specification – Basic optical cable test procedures – Environmental tests methods* (disponible en anglais seulement)

IEC 60794-1-23, *Optical fibre cables – Part 1-23: Generic specification – Basic optical cable test procedures – Cable element test methods* (disponible en anglais seulement)

IEC 60794-1-24, *Câbles à fibres optiques – Partie 1-24: Spécification générique – Méthodes fondamentales d'essais applicables aux câbles optiques – Méthodes d'essais électriques*

IEC 60794-3, *Câbles à fibres optiques – Partie 3: Câbles extérieurs – Spécification intermédiaire*

IEC 60794-4-20:2012, *Optical fibre cables – Part 4-20: Aerial optical cables along power lines – Family specification for ADSS (All Dielectric Self Supported) optical cables* (disponible en anglais seulement)

IEC 60811-202, *Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux non métalliques – Partie 202: Essais généraux – Mesure de l'épaisseur des gaines non métalliques*

IEC 60811-203, *Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux non métalliques – Partie 203: Essais généraux – Mesure des dimensions extérieures*

IEC 60811-401, *Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux non métalliques – Partie 401: Essais divers – Méthodes de vieillissement thermique – Vieillissement en étuve à air*

IEC 60811-406, *Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux non métalliques – Partie 406: Essais divers – Résistance des mélanges polyéthylène et polypropylène aux craquelures*

IEC 60811-501, *Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux non métalliques – Partie 501: Essais mécaniques – Détermination des propriétés mécaniques des mélanges pour les enveloppes isolantes et les gaines*

IEC 60811-604:2012, *Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux non métalliques – Partie 604: Essais physiques – Mesure de l'absence de composants corrosifs dans les matières de remplissage*

IEC 60811-607, *Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux non métalliques – Partie 607: Essais physiques – Essai pour l'évaluation de la dispersion du noir de carbone dans le polyéthylène et le polypropylène*

IEC 60888, *Fils en acier zingué pour conducteurs câblés*

IEC 60889, *Fil d'aluminium écroui dur pour conducteurs de lignes aériennes*

IEC 61089:1991, *Conducteurs pour lignes aériennes à brins circulaires, câblés en couches concentriques*

IEC 61232, *Fils d'acier revêtus d'aluminium pour usages électriques*

IEC 61394, *Overhead lines – Requirements for greases for aluminium, aluminium alloy and steel bare conductors* (disponible en anglais seulement)

IEC 61395, *Conducteurs pour lignes électriques aériennes – Procédures d'essai de fluage pour conducteurs câblés*