



IEC 60794-4-20

Edition 2.0 2018-08
REDLINE VERSION

INTERNATIONAL STANDARD



**Optical fibre cables –
Part 4-20: Sectional specification – Aerial optical cables along electrical power
lines – Family specification for ADSS (all dielectric self-supported) optical cables**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.180.10

ISBN 978-2-8322-6009-8

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CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references	7
3 Terms, definitions and abbreviated terms	8
4 Optical fibres	10
General.....	
Attenuation	
Attenuation coefficient.....	
Attenuation discontinuities.....	
Cut-off wavelength of cabled fibre	
Fibre colouring	
Polarisation mode dispersion (PMD).....	
5 Cable elements	11
6 Optical fibre cable constructions	11
6.1 General.....	11
Optical unit	
6.2 Cable protection elements	11
7 Main requirements for installation and operating conditions	12
8 Cable design considerations	12
9 Cable tests	13
9.1 General.....	13
Classification of tests	
Type tests.....	
Factory acceptance tests	
Routine tests	
9.2 Tensile performance.....	14
9.2.1 General	14
9.2.2 Family requirement	15
9.2.3 Test conditions	15
9.3 Sheave test.....	15
9.3.1 General	15
9.3.2 Family requirement	16
9.3.3 Test conditions	16
Installation capability.....	
9.4 Repeated bending.....	16
9.4.1 General	16
9.4.2 Family requirements.....	16
9.4.3 Test conditions	16
9.5 Impact	17
9.5.1 General	17
9.5.2 Family requirements.....	17
9.5.3 Test conditions	17
9.6 Crush.....	17
9.6.1 General	17
9.6.2 Test requirements.....	17

9.6.3	Test conditions	17
	Kink	
9.7	Torsion	18
9.7.1	General	18
9.7.2	Test requirements	18
	Vibration testing	
9.8	Aeolian vibration test.....	18
9.8.1	General	18
9.8.2	Family requirements.....	18
9.8.3	Test conditions	18
9.8.4	Parameters to be reported.....	18
9.9	Low frequency vibration test (galloping test)	19
9.9.1	General	19
9.9.2	Family requirements.....	19
9.9.3	Test conditions	19
9.10	Temperature cycling.....	20
9.10.1	General	20
9.10.2	Family requirements.....	20
9.10.3	Test conditions	20
9.11	Water penetration	20
9.12	Weathering resistance Cable UV resistance.....	21
9.13	Tracking and erosion resistance test.....	21
9.14	Creep behaviour	21
9.15	Fitting compatibility	22
	Factory acceptance tests	
	Routine tests	
10	Quality assurance.....	23
Annex A (informative)	Packaging and marking.....	24
Annex B (informative)	Installation considerations for ADSS cables.....	25
Annex C (informative)	Electrical test (tracking)	27
C.1	General.....	27
C.2	Option C1 C2 – Sheath material qualification	27
C.2.1	Overview	27
C.2.2	Test arrangements	27
C.2.3	Test procedure.....	28
C.2.4	Requirements	28
	Option C2 – Example of test for Sahara desert conditions	
C.3	Option C3 – Pollution level and tracking resistance	31
C.3.1	Overview	31
C.3.2	Test setup.....	31
C.3.3	Test method.....	33
C.3.4	Overview of pollution model and electrical test.....	34
Annex D (informative)	All dielectric self-supported (ADSS) cables to be used in overhead power lines (blank detail specification)	36
Bibliography	38
	Figure – Draft of test equipment	
	Figure – Test chamber	

Figure B.1 – Example of different span lengths allowed for the same cable, depending on sag variation	26
Figure C.1 – Electric scheme for the test	31
Figure C.2 – Foils of the electrodes	32
Figure C.3 – Nozzle	32
Figure C.4 – Details for the spraying	33
Figure C.5 – Pollution model Distributed element model with dry band arc gap.....	34
Figure C.6 – Basic circuit for arcing test Thevenin equivalent circuit	35
Table 1 – Cable design characteristics	13
Table 2 – Optional parameters (if required by customer).....	13
Table C.1 – R_{eq} and C_{eq} values for different pollution index values	33
Table D.1 – Blank detail specification	36

INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL FIBRE CABLES –

Part 4-20: Sectional specification – Aerial optical cables along electrical power lines – Family specification for ADSS (all dielectric self-supported) optical cables

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.
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This redline version of the official IEC Standard allows the user to identify the changes made to the 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 60794-4-20 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2012 and constitutes a technical revision.

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

- a) this document has been streamlined by cross-referencing IEC 60794-1-1, IEC 60794-4 (all parts) and IEC 60794-1-2;
- b) reference to the MICE table has been deleted;
- c) the example of test method for particular environment in Annex C has been deleted;

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

FDIS	Report on voting
86A/1867/FDIS	86A/1876/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 the 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

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

OPTICAL FIBRE CABLES –

Part 4-20: Sectional specification – Aerial optical cables along electrical power lines – Family specification for ADSS (all dielectric self-supported) optical cables

1 Scope

This part of IEC 60794-4, which is a family specification, covers optical telecommunication cables, commonly with single-mode fibres¹ ~~to be~~ used primarily in overhead power lines applications. The cables ~~may~~ can also be used in other overhead utility networks, such as for telephony or TV services. Requirements of the sectional specification IEC 60794-4 for aerial optical cables along electrical power lines are applicable to cables covered by this document.

This document covers the construction, mechanical, electrical, and optical performance, installation guidelines, acceptance criteria, test requirements, environmental considerations, and accessories compatibility for an all dielectric, self-supporting fibre optic (ADSS) cable. This document provides construction and performance requirements that ensure, within the guidelines of this document, that the ~~required mechanical capabilities~~ integrity of the cable components ~~and maintenance of optical fibre integrity and optical transmissions are proper~~ as well as optical fibre mechanical reliability and transmission parameters are maintained.

The ADSS cable consists of single mode optical fibres contained in one or more protective dielectric fibre optic units surrounded by or attached to suitable dielectric strength members and sheaths. The cable does not contain metallic components. An ADSS cable is designed to meet the optical and mechanical requirements under different ~~types of~~ installation, operating and environmental conditions and loadings, as described in Annex B.

This document excludes any "lashed" or "wrapped" OPAC cables included in IEC 60794-4. Figure 8 aerial cables are also excluded; they are specified in IEC 60794-3-20.

~~Cables intended for installation in conformity with ISO/IEC 24702 and related standards may require the specification of additional tests to ensure their suitability in the applicable environments defined by the mechanical, ingress, climatic and chemical, and electromagnetic (MICE) classification. These tests are outside of the scope of IEC 60794 cable specifications, and MICE criteria are not part of the requirements for IEC 60794 specifications. The MICE tests may be the same as, similar to, or substantially different from, the tests required by IEC 60794 specifications. Cables manufactured per IEC 60794 specifications may or may not meet the MICE criteria. For supplemental discussion, see IEC/TR 62362.~~

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.

~~IEC 60304, Standard colours for insulation for low-frequency cables and wires~~

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

¹ In some particular situations in the electrical industry, short overhead links can be also designed with multimode fibres.

~~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 60793-2-50, Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres

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

~~IEC 60794-1-2, Optical fibre cables – Part 1-2: Generic specification – Basic optical cable test procedures^{2,3}~~

IEC 60794-1-21:2015, Optical fibre cables – Part 1-21: Generic specification – Basic optical cable test procedures – Mechanical test methods

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

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

IEC 60794-4, Optical fibre cables – Part 4: Sectional Specification – Aerial optical cables along electrical power lines

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

ISO 9001, Quality management systems – Requirements

² ~~This document has been withdrawn, but can still be purchased, if necessary. Until IEC 60794-1-21 will be available, the tests stated in Clause 9 have to be taken from IEC 60794-1-2.~~

³ ~~This standard will be replaced by IEC 60794-1-21, Optical fibre cables – Part 1-21: Generic specification – Basic optical cable test procedures – Mechanical test methods (see also Bibliography), as soon as it will be available.~~

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Optical fibre cables –

Part 4-20: Sectional specification – Aerial optical cables along electrical power lines – Family specification for ADSS (all dielectric self-supported) optical cables

Câbles à fibres optiques –

Partie 4-20: Spécification intermédiaire – Câbles optiques aériens le long des lignes électriques de puissance – Spécification de famille pour les câbles optiques autoporteurs entièrement diélectriques (ADSS)

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms, definitions and abbreviated terms	7
4 Optical fibres	7
5 Cable elements	7
6 Optical fibre cable constructions	7
6.1 General.....	7
6.2 Cable protection elements.....	7
7 Main requirements for installation and operating conditions	8
8 Cable design considerations	8
9 Cable tests	9
9.1 General.....	9
9.2 Tensile performance.....	9
9.2.1 General	9
9.2.2 Family requirement	9
9.2.3 Test conditions	9
9.3 Sheave test.....	9
9.3.1 General	9
9.3.2 Family requirement	9
9.3.3 Test conditions	9
9.4 Repeated bending.....	10
9.4.1 General	10
9.4.2 Family requirements.....	10
9.4.3 Test conditions	10
9.5 Impact	10
9.5.1 General	10
9.5.2 Family requirements.....	10
9.5.3 Test conditions	10
9.6 Crush.....	10
9.6.1 General	10
9.6.2 Test requirements	11
9.6.3 Test conditions	11
9.7 Torsion	11
9.7.1 General	11
9.7.2 Test requirements	11
9.8 Aeolian vibration test.....	11
9.8.1 General	11
9.8.2 Family requirements.....	11
9.8.3 Test conditions	11
9.8.4 Parameters to be reported.....	11
9.9 Low frequency vibration test (galloping test)	12
9.9.1 General	12
9.9.2 Family requirements.....	12
9.9.3 Test conditions	12

9.10	Temperature cycling	12
9.10.1	General	12
9.10.2	Family requirements	12
9.10.3	Test conditions	12
9.11	Water penetration	13
9.12	Cable UV resistance	13
9.13	Tracking and erosion resistance test	13
9.14	Creep	13
9.15	Fitting compatibility	14
10	Quality assurance	14
	Annex A (informative) Packaging and marking	15
	Annex B (informative) Installation considerations for ADSS cables	16
	Annex C (informative) Electrical test (tracking)	18
C.1	General	18
C.2	Option C2 – Sheath material qualification	18
C.2.1	Overview	18
C.2.2	Test arrangements	18
C.2.3	Test procedure	19
C.2.4	Requirements	19
C.3	Option C3 – Pollution level and tracking resistance	19
C.3.1	Overview	19
C.3.2	Test setup	20
C.3.3	Test method	22
C.3.4	Overview of pollution model and electrical test	22
	Annex D (informative) All dielectric self-supported (ADSS) cables to be used in overhead power lines (blank detail specification)	24
	Bibliography	26
	Figure B.1 – Example of different span lengths allowed for the same cable, depending on sag variation	17
	Figure C.1 – Electric scheme for the test	20
	Figure C.2 – Foils of the electrodes	20
	Figure C.3 – Nozzle	21
	Figure C.4 – Details for the spraying	21
	Figure C.5 – Distributed element model with dry band arc gap	23
	Figure C.6 – Thevenin equivalent circuit	23
	Table 1 – Cable design characteristics	8
	Table 2 – Optional parameters (if required by customer)	8
	Table C.1 – R_{eq} and C_{eq} values for different pollution index values	22
	Table D.1 – Blank detail specification	24

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

IEC 60793-2-50, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

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

IEC 60794-1-21:2015, *Optical fibre cables – Part 1-21: Generic specification – Basic optical cable test procedures – Mechanical test methods*

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

¹ In some particular situations in the electrical industry, short overhead links can be also designed with multimode fibres.

IEC 60794-4, *Optical fibre cables – Part 4: Sectional specification – Aerial optical cables along electrical power lines*

ISO 9001, *Quality management systems – Requirements*

SOMMAIRE

AVANT-PROPOS.....	30
1 Domaine d'application.....	32
2 Références normatives	32
3 Termes, définitions et termes abrégés.....	33
4 Fibres optiques.....	33
5 Eléments de câble	33
6 Constructions de câble à fibres optiques	33
6.1 Généralités	33
6.2 Eléments de protection de câbles	33
7 Exigences principales relatives aux conditions d'installation et de fonctionnement	34
8 Considérations sur la conception des câbles	34
9 Essais du câble	35
9.1 Généralités	35
9.2 Performance en traction	35
9.2.1 Généralités	35
9.2.2 Exigence de famille.....	35
9.2.3 Conditions d'essai.....	35
9.3 Essai de passage sur poulies	36
9.3.1 Généralités	36
9.3.2 Exigence de famille.....	36
9.3.3 Conditions d'essai.....	36
9.4 Courbures répétées.....	36
9.4.1 Généralités	36
9.4.2 Exigences de famille	36
9.4.3 Conditions d'essai.....	36
9.5 Impact	37
9.5.1 Généralités	37
9.5.2 Exigences de famille	37
9.5.3 Conditions d'essai.....	37
9.6 Ecrasement.....	37
9.6.1 Généralités	37
9.6.2 Exigences relatives aux essais.....	37
9.6.3 Conditions d'essai.....	37
9.7 Torsion	37
9.7.1 Généralités	37
9.7.2 Exigences relatives aux essais.....	38
9.8 Essai de vibration éolienne.....	38
9.8.1 Généralités	38
9.8.2 Exigences de famille	38
9.8.3 Conditions d'essai.....	38
9.8.4 Paramètres à consigner	38
9.9 Essai de vibration à basse fréquence (essai de galop).....	38
9.9.1 Généralités	38
9.9.2 Exigences de famille	38
9.9.3 Conditions d'essai.....	38

9.10	Cycles de température	39
9.10.1	Généralités	39
9.10.2	Exigences de famille	39
9.10.3	Conditions d'essai	39
9.11	Pénétration d'eau	39
9.12	Résistance du câble aux UV	39
9.13	Essai de résistance au cheminement et à l'érosion	40
9.14	Fluage	40
9.15	Compatibilité des armatures	40
10	Assurance de la qualité	41
Annexe A (informative) Emballage et marquage		42
Annexe B (informative) Considérations sur l'installation de câbles ADSS		43
Annexe C (informative) Essai électrique (cheminement)		45
C.1	Généralités	45
C.2	Option C2 – Qualification de matériaux de gaine	45
C.2.1	Aperçu	45
C.2.2	Montage d'essai	45
C.2.3	Procédure d'essai	46
C.2.4	Exigences	46
C.3	Option C3 – Niveau de pollution et résistance au cheminement	46
C.3.1	Aperçu	46
C.3.2	Montage d'essai	47
C.3.3	Méthode d'essai	49
C.3.4	Présentation du modèle de pollution et de l'essai électrique	49
Annexe D (informative) Câbles autoporteurs entièrement diélectriques (ADSS) à utiliser dans des lignes aériennes de puissance (spécification particulière-cadre)		51
Bibliographie		53
Figure B.1 – Exemple de différentes longueurs de portée autorisées pour le même câble, en fonction de la variation du fléchissement		44
Figure C.1 – Schéma électrique de l'essai		47
Figure C.2 – Feuilles des électrodes		47
Figure C.3 – Buse		48
Figure C.4 – Détails de la pulvérisation		49
Figure C.5 – Modèle d'éléments distribués avec espace de formation d'arcs le long de zones sèches		50
Figure C.6 – Circuit équivalent de Thévenin		50
Tableau 1 – Caractéristiques de conception du câble		34
Tableau 2 – Paramètres facultatifs (si exigés par le client)		35
Tableau C.1 – Valeurs de R_{eq} et C_{eq} pour différentes valeurs d'indice de pollution		49
Tableau D.1 – Spécification particulière-cadre		51

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

CÂBLES À FIBRES OPTIQUES –

Partie 4-20: Spécification intermédiaire – Câbles optiques aériens le long des lignes électriques de puissance – Spécification de famille pour les câbles optiques autoporteurs entièrement diélectriques (ADSS)

AVANT-PROPOS

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La Norme internationale IEC 60794-4-20 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 2012 dont elle constitue une révision technique.

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

- a) le présent document a été simplifié par établissement de correspondances avec les normes IEC 60794-1-1, IEC 60794-4 (toutes les parties) et IEC 60794-1-2;
- b) la référence au tableau MICE a été supprimée;

c) l'exemple de méthode d'essai pour un environnement particulier à l'Annexe C a été supprimé;

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

FDIS	Rapport de vote
86A/1867/FDIS	86A/1876/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 à la publication recherchée. A cette date, le document sera

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

IMPORTANT – Le logo "colour inside" qui se trouve sur la page de couverture de cette publication indique qu'elle contient des couleurs qui sont considérées comme utiles à une bonne compréhension de son contenu. Les utilisateurs devraient, par conséquent, imprimer cette publication en utilisant une imprimante couleur.

CÂBLES À FIBRES OPTIQUES –

Partie 4-20: Spécification intermédiaire – Câbles optiques aériens le long des lignes électriques de puissance – Spécification de famille pour les câbles optiques autoporteurs entièrement diélectriques (ADSS)

1 Domaine d'application

La présente partie de l'IEC 60794-4, qui est une spécification de famille, couvre les câbles optiques de télécommunication généralement équipés de fibres unimodales¹, utilisés principalement dans des applications le long des lignes aériennes à haute tension. Les câbles peuvent également être utilisés dans d'autres réseaux de services aériens, tels que des services de téléphonie ou de télévision. Les exigences de la spécification intermédiaire IEC 60794-4 pour des câbles optiques aériens le long de lignes électriques de puissance sont applicables aux câbles couverts par le présent document.

Le présent document couvre la construction, les performances mécaniques, électriques et optiques, les lignes directrices relatives à l'installation, les critères d'acceptation, les exigences relatives aux essais, les considérations sur l'environnement et la compatibilité des accessoires pour câble fibronique autoporteur entièrement diélectrique (ADSS: *all dielectric self-supporting*). Le présent document fournit des exigences de performances et de construction qui garantissent, par les lignes directrices du présent document, que sont maintenus l'intégrité mécanique exigée des composants du câble ainsi que les paramètres de transmission et la fiabilité mécanique des fibres optiques.

Le câble ADSS est constitué de fibres optiques unimodales contenues dans une ou plusieurs unités fibroniques diélectriques de protection entourées de, ou fixées à des gaines et des éléments de rigidité diélectrique appropriée. Le câble ne contient pas de composants métalliques. Un câble ADSS est conçu pour satisfaire aux exigences mécaniques et optiques dans différentes conditions d'installations, de fonctionnement et d'environnement et pour différentes charges, comme cela est décrit à l'Annexe B.

Le présent document exclut les câbles OPAC "lacés" ou "enroulés" inclus dans l'IEC 60794-4. Les câbles aériens figure-8 sont également exclus; ils sont spécifiés dans l'IEC 60794-3-20.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences 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 60793-2, *Fibres optiques – Partie 2: Spécifications de produits – Généralités*

IEC 60793-2-50, *Fibres optiques – Partie 2-50: Spécifications de produits – Spécification intermédiaire pour les fibres unimodales de classe B*

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

¹ Dans des situations particulières de l'industrie électrique, de courtes liaisons aériennes peuvent également être conçues avec des fibres multimodales.

IEC 60794-1-21:2015, *Optical fibre cables – Part 1-21: Generic specification – Basic optical cable test procedures – Mechanical test methods* (disponible en anglais seulement)

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

IEC 60794-4, *Câbles à fibres optiques – Partie 4: Spécification intermédiaire – Câbles optiques aériens le long des lignes électriques de puissance*

ISO 9001, *Systèmes de management de la qualité – Exigences*