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IEC 60794-4-20

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# INTERNATIONAL STANDARD



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**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

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## 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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- 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.

**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.

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## 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 fibres<sup>1</sup> ~~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~~

<sup>1</sup> 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<sup>2,3</sup>~~

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

<sup>2</sup> ~~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.~~

<sup>3</sup> ~~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)**

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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 integrity of the cable components 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 installation, operating and environmental conditions and loadings, as described in Annex B.

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#### 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 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*

<sup>1</sup> 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*

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## 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)**

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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.

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## 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 unimodales<sup>1</sup>, 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*

<sup>1</sup> 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*