

SLOVENSKI STANDARD

SIST EN IEC 60794-4-20:2019

01-januar-2019

Nadomešča:

SIST EN 60794-4-20:2013

Optični kabli - 4-20. del: Področna specifikacija - Nadzemni optični kabli vzdolž elektroenergetskih vodov - Skupinska specifikacija za ADSS (dielektrične samonosne) optične kable (IEC 60794-4-20:2018)

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 (IEC 60794-4-20:2018)

Lichtwellenleiterkabel - Teil 4-20: Lichtwellenleiter-Luftkabel auf Starkstrom-Freileitungen - Familienspezifikation für ADSS-LWL-Kabel (dielektrische, selbsttragende LWL-Kabel) (IEC 60794-4-20:2018)

<https://standards.iteh.ai/catalog/standards/sist/8e25ca08-fd35-4962-8eaa-c83bc414623b/sist-en-iec-60794-4-20-2019>

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) (IEC 60794-4-20:2018)

Ta slovenski standard je istoveten z: EN IEC 60794-4-20:2018

ICS:

33.180.10 (Optična) vlakna in kabli Fibres and cables

SIST EN IEC 60794-4-20:2019 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN IEC 60794-4-20:2019

<https://standards.iteh.ai/catalog/standards/sist/8e25ca08-fd35-4962-8eaa-c83bc414623b/sist-en-iec-60794-4-20-2019>

EUROPEAN STANDARD

EN IEC 60794-4-20

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2018

ICS 33.180.10

Supersedes EN 60794-4-20:2012

English Version

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 (IEC 60794-4-20:2018)

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)
(IEC 60794-4-20:2018)

Lichtwellenleiterkabel - Teil 4-20: Lichtwellenleiter-Luftkabel auf Starkstrom-Freileitungen - Familienspezifikation für ADSS-LWL-Kabel (dielektrische, selbsttragende LWL-Kabel)
(IEC 60794-4-20:2018)

This European Standard was approved by CENELEC on 2018-10-02. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 60794-4-20:2018 (E)**European foreword**

The text of document 86A/1867/FDIS, future edition 2 of IEC 60794-4-20, prepared by SC 86A "Fibres and cables" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60794-4-20:2018.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2019-07-02
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-10-02

This document supersedes EN 60794-4-20:2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice**iTeh STANDARD PREVIEW**

The text of the International Standard IEC 60794-4-20:2018 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:

- SIST EN IEC 60794-4-20:2019
<https://standards.iteh.ai/catalog/standards/sist/8c25ca08-1d35-4962-8caa-c83bc414623b/sist-en-iec-60794-4-20-2019>
- IEC 60060-1:2010 NOTE Harmonized as EN 60060-1:2010 (not modified)
 - IEC 60794-1-2 NOTE Harmonized as EN 60794-1-2
 - IEC 60794-3-20 NOTE Harmonized as EN 60794-3-20
 - IEC 60794-4 series NOTE Harmonized as EN 60794-4 series
 - IEC 61395 NOTE Harmonized as EN 61395
 - IEC 61935 series NOTE Harmonized as EN 61935 series

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60793-2	-	Optical fibres - Part 2: Product specifications - General	EN 60793-2	-
IEC 60793-2-50	-	Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres	EN 60793-2-50	-
IEC 60794-1-1	-	Optical fibre cables - Part 1-1: Generic specification - General	EN 60794-1-1	-
IEC 60794-1-21	2015	Optical fibre cables - Part 1-21: Generic specification - Basic optical cable test procedures - Mechanical tests methods	EN 60794-1-21	2015
IEC 60794-1-22	-	Optical fibre cables - Part 1-22: Generic specification - Basic optical cable test procedures - Environmental test methods	EN IEC 60794-1-22	-
IEC 60794-4	-	Optical fibre cables - Part 4: Sectional specification - Aerial optical cables along electrical power lines	EN IEC 60794-4	-
ISO 9001	-	Quality management systems Requirements	-EN ISO 9001	-

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN IEC 60794-4-20:2019](https://standards.iteh.ai/catalog/standards/sist/8e25ca08-fd35-4962-8eaa-c83bc414623b/sist-en-iec-60794-4-20-2019)

<https://standards.iteh.ai/catalog/standards/sist/8e25ca08-fd35-4962-8eaa-c83bc414623b/sist-en-iec-60794-4-20-2019>



IEC 60794-4-20

Edition 2.0 2018-08

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)

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.180.10

ISBN 978-2-8322-5907-8

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

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 mode 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

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.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 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.

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.

iTeh STANDARD PREVIEW (standards.itech.ai)

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.

SIST EN IEC 60794-4-20:2019
<https://standards.itech.ai/catalog/standards/sist/8c25ca08-1d55-4962-8eaa-c83bc414623b/sist-en-iec-60794-4-20-2019>

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 used primarily in overhead power lines applications. The cables 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 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.

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.

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*

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