

© Copyright SEK Svensk Elstandard. Reproduction in any form without permission is prohibited.

## Optokablar – Del 6: Inom- och utomhuskablar – Gruppspecifikation för inom- och utomhuskablar

*Optical fibre cables –  
Part 6: Indoor-outdoor cables –  
Sectional specification for indoor-outdoor cables*

Som svensk standard gäller europastandarden EN IEC 60794-6:2020. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 60794-6:2020.

### Nationellt förord

Europastandarden EN IEC 60794-6:2020

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 60794-6, First edition, 2020 - Optical fibre cables - Part 6: Indoor-outdoor cables - Sectional specification for indoor-outdoor cables**

utarbetad inom International Electrotechnical Commission, IEC.

---

ICS 33.180.10

---

Denna standard är fastställd av SEK Svensk Elstandard, som också kan lämna upplysningar om **sakinnehållet** i standarden.  
Postadress: Box 1284, 164 29 KISTA  
Telefon: 08 - 444 14 00.  
E-post: sek@elstandard.se. Internet: www.elstandard.se

---

### *Standarder underlättar utvecklingen och höjer elsäkerheten*

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

### *SEK är Sveriges röst i standardiseringsarbetet inom elområdet*

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

### *Stora delar av arbetet sker internationellt*

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

### *Var med och påverka!*

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

### **SEK Svensk Elstandard**

Box 1284  
164 29 Kista  
Tel 08-444 14 00  
[www.elstandard.se](http://www.elstandard.se)

ICS 33.180.10

English Version

Optical fibre cables - Part 6: Indoor-outdoor cables - Sectional  
specification for indoor-outdoor cables  
(IEC 60794-6:2020)

Câbles à fibres optiques - Partie 6: Câbles  
intérieurs/extérieurs - Spécification intermédiaire pour les  
câbles intérieurs/extérieurs  
(IEC 60794-6:2020)

Lichtwellenleiterkabel - Teil 6: Innen-/Außenkabel -  
Rahmenspezifikation für Innen-/Außenkabel  
(IEC 60794-6:2020)

This European Standard was approved by CENELEC on 2020-10-30. 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, 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**

---

## **European foreword**

The text of document 86A/2042/FDIS, future edition 1 of IEC 60794-6, 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 60794-6:2020.

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) 2021-07-30
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-10-30

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**

The text of the International Standard IEC 60794-6:2020 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:

IEC 60794 (series)	NOTE	Harmonized as EN 60794 (series)
IEC 60794-1-2	NOTE	Harmonized as EN 60794-1-2
IEC 60794-1-3	NOTE	Harmonized as EN 60794-1-3
IEC 60794-1-22	NOTE	Harmonized as EN IEC 60794-1-22
IEC 60794-1-23	NOTE	Harmonized as EN IEC 60794-1-23
IEC 60794-1-24	NOTE	Harmonized as EN 60794-1-24
IEC 60794-1-219	NOTE	Harmonized as EN IEC 60794-1-219 <sup>1</sup>
IEC 60794-3-10	NOTE	Harmonized as EN 60794-3-10
IEC 60811-203	NOTE	Harmonized as EN 60811-203

---

<sup>1</sup> To be published. Stage at the time of publication: prEN IEC 60794-1-219:2020.

## 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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60793-1-40	-	Optical fibres - Part 1-40: Attenuation measurement methods	EN IEC 60793-1-40	-
IEC 60793-2	-	Optical fibres - Part 2: Product specifications	-	-
IEC 60794-1-1	-	Optical fibre cables - Part 1-1: Generic specification - General	EN 60794-1-1	-
IEC 60794-1-21	-	Optical fibre cables - Part 1-21: Generic specification - Basic optical cable test procedures - Mechanical tests methods	EN 60794-1-21	-
IEC 60794-2	2017	Optical fibre cables - Part 2: Indoor cables - Sectional specification	EN 60794-2	2017
IEC 60794-3	2014	Optical fibre cables - Part 3: Outdoor cables - Sectional specification	EN 60794-3	2015
IEC 60794-6-10	-	Optical fibre cables - Part 6-10: Indoor-outdoor cables - Family specification for universal indoor-outdoor cables	-	-
IEC 60794-6-20	-	Optical fibre cables - Part 6-20: Indoor-outdoor cables - Family specification for flame retardant outdoor cables	-	-
IEC 60794-6-30	-	Optical fibre cables - Part 6-30: Indoor-outdoor cables - Family specification for weatherised indoor cables	-	-

## CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references .....	5
3 Terms, definitions and abbreviated terms .....	6
3.1 Terms and definitions.....	6
3.2 Abbreviated terms.....	6
4 Optical fibres .....	6
5 Cable elements .....	6
5.1 General.....	6
5.2 Materials compatibility .....	7
5.3 Optical elements .....	7
5.4 Testing of cable elements .....	7
5.5 Cable elements to be used for indoor-outdoor cable .....	7
6 Common specifications for indoor-outdoor cables .....	7
7 Installation and operating conditions.....	8
8 Characterization of cable elements.....	8
9 Test conditions for indoor-outdoor cables .....	8
9.1 Test methods applicable for indoor-outdoor cables .....	8
9.2 Fire performance .....	9
10 Quality assurance.....	9
11 Packaging .....	9
Bibliography.....	10
 Table 1 – Key cable performance parameters for indoor-outdoor cables compared to indoor and outdoor cables.....	 8

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## OPTICAL FIBRE CABLES –

**Part 6: Indoor-outdoor cables –  
Sectional specification for indoor-outdoor 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 60794-6 has been prepared by subcommittee SC 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

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

FDIS	Report on voting
86A/2042/FDIS	86A/2052/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

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

## OPTICAL FIBRE CABLES –

### Part 6: Indoor-outdoor cables – Sectional specification for indoor-outdoor cables

#### 1 Scope

This part of IEC 60794 is a sectional specification covering general features of optical fibre cables applicable to outdoor as well as indoor environments, called "indoor-outdoor cables". Indoor-outdoor cables are deployed in outside plant environments as well as in premises thus fulfilling outdoor as well as indoor requirements. Typical application spaces are, for example, extension of a duct cable into a building or using this design for centralized cabling in the central office, the premises or local area network where the same cable is used for the entire length of the cabling link including both the indoor as well as the outdoor portions.

Cables which generally possess the characteristics associated with outdoor cable designs having the thermal and mechanical robustness that makes them suitable for use in the outside plant, while simultaneously being relatively flexible, compact and lightweight and exhibiting the fire performance required in indoor premises are specified in IEC 60794-6-10.

Flame retardant outdoor cables as specified in IEC 60794-6-20 are used when most of the cable length is deployed as an outdoor cable with a part of its length deployed indoors. The cable design can be derived from a typical outdoor cable design according to the product specifications described in IEC 60794-3. The specific performance related to bend radii according to the installation situation and fire performance according to the regional legislation mainly requires the appropriate selection of the jacket material in combination with other material and/or design considerations. Because of the use in buildings with tighter space restrictions, higher flexibility of the cable is often required for the installation. Often, smaller diameter cables are preferred.

Indoor cables which are weatherised as specified in (IEC 60794-6-30) are used when an indoor cable is used outdoors over a short distance (few meters), for example when the network access point (NAP) is very close to the building. The indoor-outdoor fibre optical cable design can be derived from an indoor design (see IEC 60794-2 and IEC TR 62901 for typical applications) with specific outdoor performance features added. Critical parameters are UV stability, and resistance against exposure to humidity.

#### 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 60793-1-40, *Optical fibres – Part 1-40: Attenuation measurement methods*

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 test methods*

IEC 60794-2:2017, *Optical fibre cables – Part 2: Indoor cables – Sectional specification*

IEC 60794-3:2014, *Optical fibre cables – Part 3: Outdoor cables – Sectional specification*

IEC 60794-6-10, *Optical fibre cables – Part 6-10: Indoor-outdoor cables – Family specification for universal indoor-outdoor cables*

IEC 60794-6-20, *Optical fibre cables – Part 6-20: Indoor-outdoor cables – Family specification for flame retardant outdoor cables*

IEC 60794-6-30, *Optical fibre cables – Part 6-30: Indoor-outdoor cables – Family specification for weatherised indoor cables*