

INTERNATIONAL STANDARD



**Optical fibre cables –
Part 3-21: Outdoor cables – Product specification for optical self-supporting
aerial telecommunication cables for use in premises cabling**



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aerial telecommunication cables for use in premises cabling**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL FIBRE CABLES –

**Part 3-21: Outdoor cables –
Product specification for optical self-supporting aerial
telecommunication cables for use in premises cabling**

FOREWORD

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International Standard IEC 60794-3-21 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 2005. This edition constitutes a technical revision.

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

- a) reference to ISO 24702;
- b) reference to Fibre B6 (IEC 60793-2-50);
- c) reference to the OS2 Fibre as defined by ISO/IEC 11801.

This standard shall be used in conjunction with IEC 60794-1-1, IEC 60794-1-2, IEC 60794-3 and IEC 60794-3-20.

The text of this standard is based on the following documents:

| | |
|--------------|------------------|
| CDV | Report on voting |
| 86A/1564/CDV | 86A/1624/RVC |

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

This publication 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 publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

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OPTICAL FIBRE CABLES –

Part 3-21: Outdoor cables – Product specification for optical self-supporting aerial telecommunication cables for use in premises cabling

1 Scope

This part of IEC 60794 is a product specification. It presents the detailed requirements specific to optical self-supporting aerial telecommunication cables for use in premises cabling to ensure compatibility with ISO/IEC 11801 and ISO/IEC 24702. The requirements of the family specification IEC 60794-3-20 and sectional specification IEC 60794-3 are applicable to cables covered by this standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60793-2-10:2011, *Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres*

IEC 60793-2-50:2012, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

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

IEC 60794-1-2, *Optical fibre cables – Part 1-2: Generic specification – Cross reference table for optical cable test procedures*

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

IEC 60794-3-20, *Optical fibre cables – Part 3-20: Outdoor cables – Family specification for self-supporting aerial telecommunication cables*

ISO/IEC 11801, *Information technology – Generic cabling for customers premises*

ISO/IEC 24702, *Information technology – Generic cabling – Industrial premises*

3 General requirements

The cable shall comply with the family specification, IEC 60794-3-20, and meet the requirements which are defined in it, including requirements in the sectional specification, IEC 60794-3.

The optical fibre contained in cables covered by this standard shall comply with one of the following standards, and meet the normative requirements defined within them as applicable:

- IEC 60793-2-50:2012, Annex A (Single-mode fibre category B1.1);

- IEC 60793-2-50: 2012, Annex C (Single-mode fibre category B1.3);
- IEC 60793-2-10:2011, Annex A (Multimode fibre, sub-category A1a, 50 µm core diameter);
- IEC 60793-2-10:2011, Annex B (Multimode fibre, sub-category A1b, 62,5 µm core diameter).

To ensure compatibility with ISO/IEC 11801 and ISO/IEC 24702, optical performance level requirements are presented in terms of the following performance classification codes:

- OS1 single-mode fibre, category B1.1, B1.3, or B6;
- OS2 single-mode fibre, category B1.3 or sub-category B6_a;
- OM1 multimode fibre, sub-category A1a or A1b;
- OM2 multimode fibre, sub-category A1a or A1b;
- OM3 multimode fibre, model A1a.2;
- OM4 multimode fibre, model A1a.3.

NOTE These codes are informative from the perspective of the requirements defined in IEC 60794-3-20.

4 Particular requirements

4.1 General

These requirements either define a specific option relative to the requirements of IEC 60794-3-20 or define additional requirements.

4.2 Environmental requirements – Temperature cycling

The cable shall meet the requirements of ISO/IEC 11801 and ISO/IEC 24702, with the following values:

- TA1: –10 °C TA2: –25 °C TA3: –40 °C
- TB1: +60 °C TB2: +70 °C

4.3 Transmission requirements

4.3.1 Attenuation of cabled fibre

Depending on the fibre type, the attenuation coefficient of the cabled fibre shall be less than the maximum values in Table 1 for the multimode fibres, and less than the maximum values in Table 2 for single-mode fibres – for the wavelengths listed in the Table 1 column headings and in Table 2.

The fibre type shall be agreed between customer and supplier.

Table 1 – Multimode maximum cable attenuation coefficient (dB/km)

| Fibre specification | Attenuation coefficient at 850 nm | Attenuation coefficient at 1 300 nm | Performance classification code |
|-----------------------------|-----------------------------------|-------------------------------------|---------------------------------|
| IEC 60793-2-10, model A1a.1 | 3,5 | 1,5 | OM1, OM2 |
| IEC 60793-2-10, model A1a.2 | 3,5 | 1,5 | OM3 |
| IEC 60793-2-10, model A1a.3 | 3,5 | 1,5 | OM4 |
| IEC 60793-2-10, model A1b | 3,5 | 1,5 | OM1, OM2 |

Table 2 – Single-mode maximum cable attenuation coefficient (dB/km)

| Fibre specification | Wavelength nm | Maximum attenuation coefficient | Performance classification code |
|----------------------------------|---------------------|---------------------------------|---------------------------------|
| IEC 60793-2-50, B1.3guy, or B6_a | 1 310, 1 383, 1 550 | 1,0 | OS1 |
| IEC60793-2-50, B1.3 or B6_a | 1 310, 1 383, 1 550 | 0,4 | OS2 |

NOTE IEC SC86A has recommended to ISO/IEC JTC1 SC25 to modify the requirements for OS1 and OS2 fibre in ISO/IEC 11801. The requirements in Table 2 are consistent with these recommendations. In the case of OS1 fibre in installations specified prior to ISO 11801, in which either B1.1 fibre is used or if the B1 fibre type is unknown, the 1 383 nm requirement is not applicable.

4.3.2 Fibre bandwidth requirements

There are no bandwidth requirements on single-mode fibres.

For cables containing multimode fibres, the uncabled fibre shall be specified at one of performance levels defined in Table 3 in terms of minimum bandwidth (MHz·km), wavelength, and type of measurement.

The fibre type and performance level shall be agreed between customer and supplier.

Table 3 – Minimum multimode fibre bandwidth (MHz·km)

| Fibre specification | Nominal core diameter μm | Overfilled bandwidth at 850 nm | Overfilled bandwidth at 1 300 nm | Effective modal bandwidth at 850 nm | Performance classification code |
|----------------------------------|-------------------------------------|--------------------------------|----------------------------------|-------------------------------------|---------------------------------|
| IEC 60793-2-10, model A1a.1 | 50 | 200 | 500 | Non-applicable | OM1 |
| IEC 60793-2-10, model A1a.1 | 50 | 500 | 500 | Non-applicable | OM2 |
| IEC 60793-2-10, model A1a.2 | 50 | 1 500 | 500 | 2 000 | OM3 |
| IEC 60793-2-10, model A1a.3 | 50 | 3 500 | 500 | 4 700 | OM4 |
| IEC 60793-2-10, sub-category A1b | 62,5 | 200 | 500 | Non-applicable | OM1 |
| IEC 60793-2-10, sub-category A1b | 62,5 | 500 | 500 | Non-applicable | OM2 |

4.3.3 Polarization mode dispersion (PMD) requirements

Cables containing single-mode fibres shall meet the PMD requirements of IEC 60794-3.

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