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INTERNATIONAL STANDARD

COMMENTED VERSION

Optical fibre cables -
Part 3-11: Outdoor cables – ~~Product~~ Detailed specification for duct, directly buried, and lashed aerial ~~single-mode~~ optical fibre telecommunication cables

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Optical fibre cables - Part 3-11: Outdoor cables - ~~Product~~ Detailed specification for duct, directly buried, and lashed aerial ~~single-mode~~ optical fibre telecommunication cables

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This commented version (CMV) of the official standard IEC 60794-3-11:2026 edition 3.0 allows the user to identify the changes made to the previous IEC 60794-3-11:2010 edition 2.0. Furthermore, comments from IEC SC 86A experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 60794-3-11 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics. It is an International Standard.

This third edition cancels and replaces the second edition published in 2010. This edition constitutes a technical revision.

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

a) subclause 5.2.2 has been enlarged to include fibre type B-657.B2;

b) this document has been updated to include multimode optical fibres.

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

Draft	Report on voting
86A/2712/FDIS	86A/2731/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

– withdrawn, or

– revised.

1 Scope

This part of IEC 60794 sets forth ~~technical~~ detailed requirements and characteristics specific to this type of ~~single-mode~~ optical fibre cables for duct, direct buried, and lashed installation.

This document includes functional, mechanical, environmental and optical requirements, recommended features and test methods for assessing the product against the stated requirements.

The specified test methods, where applicable, are those referenced in IEC 60794-1-1 and IEC 60794-1-2.

The requirements of this document supplement those of the sectional specification IEC 60794-3 and the family specification IEC 60794-3-10.

~~Multimode fibre requirements are not addressed in this standard; see IEC 60794-3-12.~~

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 60708, *Low-frequency cables with polyolefin insulation and moisture barrier polyolefin sheath*

IEC 60793-1-22, *Optical fibres - Part 1-22: Measurement methods and test procedures - Length measurement*

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

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

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 1-1: Generic specification - General*

IEC 60794-1-2, *Optical fibre cables - Part 1-2: Generic specification - Basic optical cable test procedures-General guidance*

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

IEC 60794-1-22:2017, *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 60794-1-101, *Optical fibre cables - Part 1-101: Generic specification - Basic optical cable test procedures - Mechanical tests methods - Tensile, method E1*

IEC 60794-1-102:—[1], *Optical fibre cables - Part 1-102: Generic specification - Basic optical cable test procedures - Mechanical tests methods - Abrasion, Method E2*

IEC 60794-1-103:—[2], *Optical fibre cables - Part 1-103: Generic specification - Basic optical cable test procedures - Mechanical tests methods - Crush, Method E3*

IEC 60794-1-104, *Optical fibre cables - Part 1-104: Generic specification - Basic optical cable test procedures - Mechanical tests methods - Impact, method E4*

IEC 60794-1-106:—[3], *Optical fibre cables - Part 1-106: Generic specification - Basic optical cable test procedures - Mechanical tests methods - Repeated bending, Method E6*

IEC 60794-1-107, *Optical fibre cables - Part 1-107: Generic specification - Basic optical cable test procedures - Mechanical test methods - Torsion, method E7*

IEC 60794-1-111:2023, *Optical fibre cables - Part 1-111: Generic specification - Basic optical cable test procedures - Mechanical tests methods - Bend, method E11*

IEC 60794-1-201, *Optical fibre cables - Part 1-201: Generic specification - Basic optical cable test procedures - Environmental test methods - Temperature cycling, method F1*

IEC 60794-1-209, *Optical fibre cables - Part 1-209: Generic specification - Basic optical cable test procedures - Environmental test methods - Ageing, method F9*

IEC 60794-1-219, *Optical fibre cables - Part 1-219: Generic specification - Basic optical cable test procedures - Material compatibility test, method F19*

IEC 60794-1-307, *Optical fibre cables - Part 1-307: Generic specification - Basic optical cable test procedures - Cable element test methods - Tube kinking, method G7*

IEC 60794-1-309, Optical fibre cables - Part 1-309: Generic specification - Basic optical cable test procedures - Cable element test methods - Bleeding and evaporation of filling or flooding compounds, Method G9

IEC 60794-1-310, *Optical fibre cables - Part 1-310: Generic specification - Basic optical cable test procedures - Cable element test methods - Strippability, method G10*

IEC 60794-1-403, *Optical fibre cables - Part 1-403: Generic specification - Basic optical cable test procedures - Electrical test methods - Electrical continuity test of cable metallic elements, method H3*

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1 Under preparation. Stage at the time of publication: IEC CDV 60794-1-102.

2 Under preparation. Stage at the time of publication: IEC CDV 60794-1-103.

3 Under preparation. Stage at the time of publication: IEC CDV 60794-1-106.

IEC 60794-3 (all parts), *Optical fibre cables - Part 3: Sectional specification - Outdoor cables*

IEC 60794-3-10, *Optical fibre cables - Part 3-10: Outdoor cables - Family specification for duct, directly buried and lashed aerial optical telecommunication cables*

~~IEC 60811-1-1, *Common Test methods for insulating and sheathing materials of electric cables and optical cables – Part 1-1: methods for general application – Measurement of thickness and overall dimensions – Tests for determining the mechanical properties*~~

IEC 60811-202, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 202: General tests - Measurement of thickness of non-metallic sheath*

IEC 60811-203, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 203: General tests - Measurement of overall dimensions*

IEC TR 61931, *Fibre optic - Terminology*

IEC 61753-1, *Fibre optic interconnecting devices and passive components - Performance standard - Part 1: General and guidance*

~~IEC/TR 62000, *Single mode fibre compatibility guidelines*~~

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TR 61931 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/
– ISO Online browsing platform: available at https://www.iso.org/obp

3.2 Symbols

The following symbols are used in this document:

λ_{cc}	cable cut-off wavelength
d	outer cable diameter
SZ	technique in which the lay reverses direction periodically

4 General ~~information~~ requirements

4.1 Overview

~~Single-mode~~ Optical fibres are widely used for telecommunication purposes and are cabled to satisfy the functional requirements of the installation environment. Further, cables placed into ducts and sub-ducts ~~may~~ can be installed using solely, or a combination of, pushing, pulling, air-assisted, or other non-listed installation techniques.

For duct installation, the environment and infrastructure can be varied and ~~may~~ can also involve the use of single and multiple sub-ducts.

Directly buried cables ~~may~~ can be installed by a variety of methods such as ploughing and trenching with different environments and infrastructure. This ~~may~~ can require specific cable