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Interested committees:

Title: BS EN IEC 60794-3-11 Optical fibre cables

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

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



86A/2353/CD

COMMITTEE DRAFT (CD)

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86A/2259/CD, 86A/2339/CC

IEC SC 86A : FIBRES AND CABLES

SECRETARIAT:
France

SECRETARY:
Mr Laurent Gasca

OF INTEREST TO THE FOLLOWING COMMITTEES:

PROPOSED HORIZONTAL STANDARD:



Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:

☐ EMC

☐ ENVIRONMENT

☐ QUALITY ASSURANCE

☐ SAFETY

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TITLE:

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL FIBRE CABLES –

**Part 3-11: Outdoor cables –
Detailed specification for duct, directly buried, and lashed aerial
optical fibre telecommunication cables**

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IEC 60794-3-11 has been prepared by subcommittee 86A: OPTICAL 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) the title of the specification has been updated to include lashed applications;
- b) the fibres specification clause (6.2.2) has been enlarged to include fibre types 657.A;
- c) this specification has been updated to include multimode optical fibres.

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

Draft	Report on voting
86A/XX/FDIS	86A/XX/RVD

151
152 Full information on the voting for its approval can be found in the report on voting indicated in
153 the above table.

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

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

159 The committee has decided that the contents of this document will remain unchanged until the
160 stability date indicated on the IEC website under webstore.iec.ch in the data related to the
161 specific document. At this date, the document will be

- 162 • reconfirmed,
- 163 • withdrawn,
- 164 • replaced by a revised edition, or
- 165 • amended.

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OPTICAL FIBRE CABLES –

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

1 Scope

This part of IEC 60794 sets forth detailed requirements and characteristics specific to this type of optical fibre cables for duct and direct buried installation.

This specification 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 described in detail in IEC 60794-1-21, IEC 60794-1-22, 1-23..

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

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 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*

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

IEC 60794-1-22, *Optical fibre cables - Part 1-21: Generic specification - Basic optical cable test procedures – Environmental test methods*

IEC 60794-1-23, *Optical fibre cables - Part 1-21: Generic specification - Basic optical cable test procedures – Cable element test methods*

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 60811-1-20, *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/TR 61931, *Fibre optic – Terminology*

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

3 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>

4 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.

5 General requirements

5.1 Overview

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 be installed using solely, or a combination of, pushing, pulling, and air-assisted installation techniques. For duct installation, the environment and infrastructure can be varied and may also involve the use of single and multiple sub-ducts. Directly buried cables may be installed by a variety of methods such as ploughing and trenching with different environments and infrastructure. This may require specific cable design solutions based on multiple layers of armours and sheaths. It is recognised that certain designs of cable for direct buried applications involving such solutions may also be suitable for duct installation. The functional requirements and test methods featured in this specification are based upon adherence to established and recognised installation techniques such as those included in IEC TR 62691.

5.2 General cable description

5.2.1 Characteristics of optical fibre

Single-mode optical fibres are classified according to their operational wavelength and dispersion characteristics. The fibres covered by this specification are categorised as type B and are described in IEC 60793-2-50. Single-mode fibre types featured in this specification are listed below:

- dispersion unshifted (B-652.B/D);
- bending loss insensitive (B-657.B2/B3/A1/A2);
- dispersion shifted (B-653.A/B);
- cut-off shifted (B-654.A/B/C/D/E), non-zero dispersion (B-655.C/D/E) - While cut-off shifted B1.2 fibre can be used in terrestrial applications, it is mainly used in submarine applications;
- wide-band non-zero dispersion-shifted (B-656).

Multimode optical fibres are classified according to their operational wavelength and modal bandwidth. Multimode fibres as covered by this specification are Category A1as specified in IEC 60793-2-10. multimode fibre types featured in this specification are listed below:

- A1-OM2
- A1-OM3
- A1-OM4
- A1-OM5

(See Annex A for ITU-T cabled optical fibre references).

5.2.2 Characteristics of optical fibre cable elements

Optical fibre cable elements such as buffer tubes, tensile strength elements, crush protection elements, water blocking elements, sheath removal elements and cable sheath shall be suitably designed to provide adequate means of fibre location, identification, modularity, protection during cable manufacture, installation and termination. The structure of these elements, and the materials used in their manufacture, shall not have any long-term detrimental effects on fibre performance during the service life of the cable, splice enclosure and/or cabinet. To satisfy these functional requirements, the different elements shall comply with the requirements of IEC 60794-3 series as well as those outlined in Clause 7 of this standard.

5.2.3 Characteristics of optical fibre cables

Optical fibre cables, for the intent of this standard, are completed cable products as shipped by the manufacturer typically on disposable reels. Such products do not require additional assembly, or the use of additional materials or protection to meet the requirements contained herein. Some assembly or added protection is usually required only where the cables are terminated to other cables or equipment, and typically involve the use of an optical fibre closure or other hardware to protect fibre splices or connectorization points and other cable elements like loose tubes, fibres, ribbons, etc. The required levels of protection for the fibre can be achieved by laying up or assembling the cable elements in association with suitable strength and/or anti-buckling members. These can be either metallic or non-metallic and positioned at the centre of the cable core or as peripheral members in or underneath the outer cable sheath. The cable may also contain moisture barrier tapes, metallic or non-metallic tapes, and water blocking or swellable materials.

5.2.4 Environmental and product safety requirements

IEC Guide 104 should be taken into account as far as possible. The materials of the cables in contact with the environment shall not be hazardous to the environment and personnel.