

Optical fibre cables

Part 3. Telecommunication cables — Sectional specification

The European Standard EN 60794-3 : 1994 has the status of a British Standard

ICS 33.180.10

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee EPL/86, Fibre optics, to Subcommittee EPL/86/1, Optical fibres and cables, upon which the following bodies were represented:

- British Approvals Service for Cables
- British Cable Makers Confederation
- British Telecommunications plc
- Department of Trade and Industry (National Physical Laboratory)
- Federation of the Electronics Industry
- Ministry of Defence
- National Supervising Inspectorate (BSI PC)

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 15 September 1996

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Amendments issued since publication

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The following BSI references relate to the work on this standard:
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National foreword

This British Standard has been prepared by Subcommittee EPL/86/1 and is the English language version of EN 60794-3 : 1994 *Optical fibre cables Part 3 : Telecommunications cables — Sectional specification*, published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 794-3 : 1994 published by the International Electrotechnical Commission (IEC).

Cross-references

Publication referred to	Corresponding British Standard
EN 187000 : 1992	BS EN 187000 : 1994 <i>Harmonized system of quality assessment for electronic components. Generic specification for optical fibre cables</i>
EN 188000 : 1995	BS EN 188000 : 1995 <i>Harmonized system of quality assessment for electronic components. Generic specification for optical fibres</i>
EN 188100 : 1995	BS EN 188100 : 1995 <i>Harmonized system of quality assessment for electronic components. Sectional specification: single-mode (SM) optical fibre</i>
EN 188101 : 1995	BS EN 188101 : 1995 <i>Harmonized system of quality assessment for electronic components. Family specification : single-mode dispersion unshifted (B1.1) optical fibre</i>
EN 188102 : 1995	BS EN 188102 : 1995 <i>Harmonized system of quality assessment for electronic components. Family specification : single-mode dispersion unshifted (B2) optical fibre</i>
HD 402 S2 : 1984	BS 6746C : 1993 <i>Colour chart for insulation and sheath of electric cables</i> BS 6469 <i>Insulating and sheathing materials of electric cables Part 4 Methods of test specific to polyethylene and polypropylene compounds</i>
HD 505.4.2 S1 : 1988	Section 4.2 : 1992 <i>Elongation at break after pre-conditioning. Wrapping test after pre-conditioning. Wrapping test after thermal ageing in air. Measurement of mass increase. Long-term stability test. Test method for copper-catalysed oxidative degradation</i>
HD 505.5.1 S1 : 1992	Part 5 <i>Methods of test specific to filling compounds</i> Section 5.1 : 1992 <i>Drop-point. Separation of oil. Lower temperature brittleness. Total acid number. Absence of corrosive compounds. Permittivity at 23 °C. D.C. resistivity at 23 °C and 100 °C</i>

Compliance with a British Standard does not of itself confer immunity from legal obligations.

ICS 33.180.10

Descriptors: Sectional specification, optical telecommunication cables

English version

Optical fibre cables
Part 3. Telecommunication cables
Sectional specification

(IEC 794-3 : 1994)

Câbles à fibres optiques
Partie 3. Câbles de télécommunication
Spécification intermédiaire
(CEI 794-3 : 1994)

Lichtwellenleiter-Kabel
Teil 3. Fernmeldekabel Rahmenspezifikation
(IEC 794-3 : 1994)

This European Standard was approved by CENELEC on 1994-07-05. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

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Foreword

This European Standard has been produced in accordance with a specialised agreement on work repartition and cooperation for standardization concerning fibre optics and is part of the CEN/CENELEC/ETSI (European Telecommunications Standards Institute) cooperation agreement.

It uses information provided by the ETSI on functional and system related aspects by means of two Interim European Telecommunications Standards (I-ETS).

These two documents, I-ETS 300 226: *Single-mode optical fibre cables to be used in duct and for directly buried application*, and I-ETS 300 229: *Single-mode optical fibre cables to be used for aerial application* prepared by ETSI/TM1/WG1 have been reviewed and completed by the CECC.

According to the CEN/CENELEC/ETSI cooperation agreement, this standard supersedes these two documents, automatically withdrawn at the date of publication of this standard, complemented by family specifications on duct and buried cables and aerial cables.

The text of the draft was submitted to the IEC-CENELEC parallel vote procedure and was approved by CENELEC as EN 60794-3 on 1994-07-05.

This European Standard is equivalent to EN 187100. All references in other European Standards to EN 187100 should be understood as references to this EN 60794-3.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1995-08-01
- latest date by which national standards conflicting with the EN have to be withdrawn (dow) 1995-08-01

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1 - Scope

This standard specifies the requirements of single-mode optical fibre cables which are intended to be used primarily in public telecommunications networks. Other types of applications requiring similar types of cables can be considered.

In particular, requirements for cables to be used in ducts or for directly buried application and aerial cables are included in this standard.

Underwater cables for lakes and river crossings and cables for indoor applications will be incorporated in this standard at a later stage.

For aerial application, this standard does not cover all functional aspects of cables installed in the vicinity of overhead power lines. In the case of such application additional requirements and test methods may be necessary. Moreover, this standard excludes optical ground wires and cables attached to the phase or earth conductors of overhead power lines.

Submarine cables are also excluded.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 187000	1992	Generic specification: Optical fibre cables
NOTE: EN 187000 largely corresponds to, but is not identical with IEC 794-1.		
EN 188000	1993	Generic specification: Optical fibres
NOTE: EN 188000 largely corresponds to, but is not identical with IEC 793-1.		
EN 188100 (in preparation)	-	Sectional specification: Single-mode (SM) optical fibre
EN 188101 (in preparation)	-	Family specification: Single-mode dispersion unshifted (B1.1) optical fibre
EN 188102 (in preparation)	-	Family specification: Single-mode dispersion shifted (B2) optical fibre
HD 402 S2	1984	Standard colours for insulation for low-frequency cables and wires (IEC 304:1982)
HD 505.4.2 S1	1992	Common test methods for insulating and sheathing materials of electric cables - Part 4: Methods specific to polyethylene and polypropylene compounds - Section 2 (IEC 811-4-2:1990)
HD 505.5.1 S1	1992	Common test methods for insulating and sheathing materials of electric cables - Part 5: Methods specific to filling compounds - Section 1 (IEC 811-5-1:1990)
IEC 189	series	Low-frequency cables and wires with p.v.c. insulation and p.v.c. sheath
IEC 708-1 A3	1981 1988	Low-frequency cables with polyolefin insulation and moisture barrier sheath - Part 1: General design details and requirements
CCITT/ITU-T Recommendation K.25	1988	Lightning protection of optical fibre cables

3 Symbols

For the purposes of this standard the following symbols apply.

λ_{cc}	Cabled fibre cut-off wavelength
SZ	A technique in which the lay reverses direction periodically

4 Optical fibre

4.1 General

Single-mode optical fibre shall be used which meets the requirements of EN 188100, EN 188101 or EN 188102.

4.2 Attenuation

4.2.1 Attenuation coefficient

The typical maximum attenuation coefficient of a cable at 1310 nm is 0,45 dB/km and/or at 1550 nm it is 0,30 dB/km. Particular values shall be agreed between the user and the manufacturer.

The attenuation coefficient shall be measured in accordance with EN 188 000, method 301, 302 or 303.

4.2.2 Attenuation uniformity

4.2.2.1 Attenuation discontinuities

The local attenuation shall not have point discontinuities in excess of 0,10 dB.

The test method best suited to provide the functional requirements is under consideration.

4.2.2.2 Attenuation linearity

The functional requirements are under consideration.

4.3 Cut-off wavelength

The cabled fibre cut-off wavelength λ_{cc} shall be less than the operational wavelength.