

Optical fibres —

Part 2-50: Product specifications — Sectional specification for class B single-mode fibres

The European Standard EN 60793-2-50:2004 has the status of a
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ICS 33.180.10

National foreword

This British Standard is the official English language version of EN 60793-2-50:2004. It is identical with IEC 60793-2-50:2004. It supersedes BS EN 60793-2-50:2002 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee GEL/86, Fibre optics, to Subcommittee GEL/86/1, Optical fibres and cables, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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Part 2-50 : Product specifications -
Sectional specification for
class B single-mode fibres
(IEC 60793-2-50:2004)**

Fibres optiques
Partie 2-50: Spécifications de produits -
Spécification intermédiaire
pour les fibres unimodales de classe B
(CEI 60793-2-50:2004)

Lichtwellenleiter
Teil 2-50: Produktspezifikationen -
Rahmenspezifikation für Einmodenfasern
der Kategorie B
(IEC 60793-2-50:2004)

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Foreword

The text of document 86A/880/FDIS, future edition 2 of IEC 60793-2-50, prepared by SC 86A, Fibres and cables, of IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60793-2-50 on 2004-04-01.

This European Standard supersedes EN 60793-2-50:2002.

The principle change relative to EN 60793-2-50:2002 is the addition of environmental testing requirements. Additionally, the requirements in Annex C have been clarified.

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) 2005-01-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2007-04-01

Annex ZA has been added by CENELEC.

The contents of the corrigendum of July 2004 have been included in this copy.

Endorsement notice

The text of the International Standard IEC 60793-2-50:2004 was approved by CENELEC as a European Standard without any modification.

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OPTICAL FIBRES –

Part 2-50: Product specifications – Sectional specification for class B single-mode fibres

1 Scope

This part of IEC 60793-2 is applicable to optical fibre types B1.1, B1.2, B1.3, and categories B2 and B4. These fibres are used or can be incorporated in information transmission equipment and optical fibre cables.

Three types of requirements apply to these fibres:

- general requirements, as defined in IEC 60793-2;
- specific requirements common to the class B single-mode fibres covered in this standard and which are given in Clause 3;
- particular requirements applicable to individual fibre types or specific applications, which are defined in the family specifications of Annexes A to E.

2 Normative references

The following referenced documents are indispensable for the application 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 60793-1-20:2001, *Optical fibres – Part 1-20: Measurement methods and test procedures – Fibre geometry*

IEC 60793-1-21:2001, *Optical fibres – Part 1-21: Measurement methods and test procedures – Coating geometry*

IEC 60793-1-22:2001, *Optical fibres – Part 1-22: Measurement methods and test procedures – Length measurement*

IEC 60793-1-30:2001, *Optical fibres – Part 1-30: Measurement methods and test procedures – Fibre proof test*

IEC 60793-1-31:2001, *Optical fibres – Part 1-31: Measurement methods and test procedures – Tensile strength*

IEC 60793-1-32:2001, *Optical fibres – Part 1-32: Measurement methods and test procedures – Coating strippability*

IEC 60793-1-33:2001, *Optical fibres – Part 1-33: Measurement methods and test procedures – Stress corrosion susceptibility*

IEC 60793-1-34:2001, *Optical fibres – Part 1-34: Measurement methods and test procedures – Fibre curl*

IEC 60793-1-40:2001, *Optical fibres – Part 1-40: Measurement methods and test procedures – Attenuation*

IEC 60793-1-42:2001, *Optical fibres – Part 1-42: Measurement methods and test procedures – Chromatic dispersion*

IEC 60793-1-44:2001, *Optical fibres – Part 1-44: Measurement methods and test procedures – Cut-off wavelength*

IEC 60793-1-45:2001, *Optical fibres – Part 1-45: Measurement methods and test procedures – Mode field diameter*

IEC 60793-1-46:2001, *Optical fibres – Part 1-46: Measurement methods and test procedures – Monitoring of changes in optical transmittance*

IEC 60793-1-47:2001, *Optical fibres – Part 1-47: Measurement methods and test procedures – Macrobending loss*

IEC 60793-1-50:2001, *Optical fibres – Part 1-50: Measurement methods and test procedures – Damp heat (steady state)*

IEC 60793-1-51:2001, *Optical fibres – Part 1-51: Measurement methods and test procedures – Dry heat*

IEC 60793-1-52:2001, *Optical fibres – Part 1-52: Measurement methods and test procedures – Change of temperature*

IEC 60793-1-53:2001, *Optical fibres – Part 1-53: Measurement methods and test procedures – Water immersion*

IEC 60793-2,____ *Optical fibres – Part 2: Product specifications*¹

IEC 60794-2:2002, *Optical fibre cables Part 2: Indoor cables – Sectional specification*

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

IEC 61941, *Optical fibres – Polarization mode dispersion measurement techniques for single-mode optical fibres*

IEC 62048:2002, *Optical fibres – Reliability – Power law theory*

3 Specifications

The fibre shall consist of a glass core and glass cladding in accordance with 5.2 of IEC 60793-2.

The term “glass” usually refers to material consisting of non-metallic oxides. The composition of some fibres may be all glass, or glass and glass/hard polymeric composites.

¹ To be published. The future fifth edition of IEC 60793-2 will bear the following title: *Fibre optics – Part 2: Product specifications – General*

3.1 Dimensional requirements

Relevant dimensional attributes and measurement methods are given in Table 1.

Requirements common to all fibres in class B are in Table 2.

Table 1 – Dimensional attributes and measurement methods

Attributes	Measurement methods
Cladding diameter	IEC 60793-1-20
Cladding non-circularity	IEC 60793-1-20
Core-cladding concentricity error	IEC 60793-1-20
Primary coating diameter	IEC 60793-1-21
Primary coating non-circularity	IEC 60793-1-21
Coating-cladding concentricity error	IEC 60793-1-21
Fibre length	IEC 60793-1-22

Table 2 – Requirements common to class B fibres

Attributes	Unit	Limits
Cladding diameter	μm	125 ± 1
Cladding non-circularity	%	$\leq 2,0$
Core concentricity error	μm	$\leq 0,8$
Primary coating diameter – uncoloured	μm	245 ± 10
Primary coating diameter – coloured	μm	250 ± 15
Coating-cladding concentricity error	μm	$\leq 12,5$
Fibre length	km	^a

^a Length requirements vary and should be agreed between supplier and customer.

The above limits on primary coating diameter are most commonly used in telecommunications cables. There are other applications, such as fibre for use within optical sub-systems, pigtails, or speciality applications such as for submarines, which use other primary coating diameters, several of which are listed below.

Alternative nominal primary coating diameters and tolerance (μm):

400 ± 40
700 ± 100
900 ± 100

3.2 Mechanical requirements

Relevant mechanical attributes and test methods are given in Table 3.

Requirements common to all fibres in class B are in Table 4.

Table 3 – Mechanical attributes and test methods

Attributes	Test methods
Proof test	IEC 60793-1-30
Tensile strength	IEC 60793-1-31
Primary coating strippability	IEC 60793-1-32
Stress corrosion susceptibility	IEC 60793-1-33
Fibre curl	IEC 60793-1-34