
Optična vlakna – 2-40. del: Specifikacije izdelka - Področna specifikacija za večrodna vlakna kategorije A4 (IEC 60793-2-40:2006)

Optical fibres – Part 2-40: Product specifications – Sectional specification for category A4 multimode fibres (IEC 60793-2-40:2006)

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English version

**Optical fibres -
Part 2-40: Product specifications -
Sectional specification for category A4 multimode fibres
(IEC 60793-2-40:2006)**

Fibres optiques -
Partie 2-40: Spécifications de produits -
Spécification intermédiaire pour les fibres
multimodales de la catégorie A4
(CEI 60793-2-40:2006)

Lichtwellenleiter -
Teil 2-40: Produktspezifikationen -
Rahmenspezifikation für
Mehrmodenfasern der Kategorie A4
(IEC 60793-2-40:2006)

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This European Standard was approved by CENELEC on 2006-04-01. 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.

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 86A/1050/FDIS, future edition 2 of IEC 60793-2-40, 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 60793-2-40 on 2006-04-01.

This European Standard supersedes EN 60793-2-40:2002. Main change is addition of Annexes E, F, G and H that describe new fibres with lower attenuation reflecting the current state of the art.

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) 2007-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-04-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60793-2-40:2006 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60794-1-2 NOTE Harmonized as EN 60794-1-2:2003 (not modified).
<https://standards.iteh.ai/catalog/standards/sist/9a082cc-28ad-4cf5-b0dd-5e9b8ecfb5fc/sist-en-60793-2-40-2006>

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-1	- ¹⁾	Environmental testing - Part 1: General and guidance	EN 60068-1	1994 ²⁾
IEC 60793-1	Series	Optical fibres - Part 1: Generic specification	EN 60793-1	Series
IEC 60793-1-20	- ¹⁾	Optical fibres - Part 1-20: Measurement methods and test procedures - Fibre geometry	EN 60793-1-20	2002 ²⁾
IEC 60793-1-22	- ¹⁾	Optical fibres - Part 1-22: Measurement methods and test procedures - Length measurement	EN 60793-1-22	2002 ²⁾
IEC 60793-1-40 (mod)	- ¹⁾	Optical fibres - Part 1-40: Measurement methods and test procedures - Attenuation	EN 60793-1-40	2003 ²⁾
IEC 60793-1-41	- ¹⁾	Optical fibres - Part 1-41: Measurement methods and test procedures - Bandwidth	EN 60793-1-41	2003 ²⁾
IEC 60793-1-42	- ¹⁾	Optical fibres - Part 1-42: Measurement methods and test procedures - Chromatic dispersion	EN 60793-1-42	2002 ²⁾
IEC 60793-1-43	- ¹⁾	Optical fibres - Part 1-43: Measurement methods and test procedures - Numerical aperture	EN 60793-1-43	2002 ²⁾
IEC 60793-1-46	- ¹⁾	Optical fibres - Part 1-46: Measurement methods and test procedures - Monitoring of changes in optical transmittance	EN 60793-1-46	2002 ²⁾
IEC 60793-1-47	- ¹⁾	Optical fibres - Part 1-47: Measurement methods and test procedures - Macrobending loss	EN 60793-1-47	2002 ²⁾
IEC 60793-1-50	- ¹⁾	Optical fibres - Part 1-50: Measurement methods and test procedures - Damp heat (steady state)	EN 60793-1-50	2002 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60793-1-51	- ¹⁾	Optical fibres - Part 1-51: Measurement methods and test procedures - Dry heat	EN 60793-1-51	2002 ²⁾
IEC 60793-1-52	- ¹⁾	Optical fibres - Part 1-52: Measurement methods and test procedures - Change of temperature	EN 60793-1-52	2002 ²⁾
IEC 60793-2	- ¹⁾	Optical fibres - Part 2: Product specifications - General	EN 60793-2	2004 ²⁾
IEC 60794-1-1	- ¹⁾	Optical fibre cables - Part 1-1: Generic specification - General	EN 60794-1-1	2002 ²⁾
IEC 60794-2-41	- ¹⁾	Optical fibre cables - Part 2-41: Indoor cables - Product specification for simplex and duplex buffered A4 fibres	-	-

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NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC

60793-2-40

Deuxième édition
Second edition
2006-03

Fibres optiques –

**Partie 2-40:
Spécifications de produits –
Spécification intermédiaire pour les fibres
multimodales de la catégorie A4**

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Optical fibres –

SIST EN 60793-2-40:2006

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Part 2-40:

**Product specifications –
Sectional specification for category A4
multimode fibres**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL FIBRES –

**Part 2-40: Product specifications –
Sectional specification for category A4 multimode fibres**

FOREWORD

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International Standard IEC 60793-2-40 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This International standard constitutes Part 2-40 of IEC 60793-2 series. This second edition cancels and replaces the first edition published in 2002 of which it constitutes a technical revision. Main change is addition of Annexes E, F, G, H, that describe new fibres with lower attenuation reflecting the current state of the art.

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

FDIS	Report on voting
86A/1050/FDIS	86A/1057/RVD

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.

IEC 60793 series consists of the following parts, under the general title *Optical fibres*:

- Part 1-1: Measurement methods and test procedures: General and guidance
- Parts 1-20 to 1-29: Measurement methods and test procedures for dimensions
- Parts 1-30 to 1-39: Measurement methods and test procedures for mechanical characteristics:
- Parts 1-40 to 1-49: Measurement methods and test procedures for optical characteristics
- Parts 1-50 to 1-59: Measurement methods and test procedures for environment characteristics
- Part 2: Product specifications – General
- Parts 2-10 to 2-50: Product specifications – Sectional specifications
- Part 2-10: Sectional specification for category A1 multimode fibres
- Part 2-20: Sectional specification for category A2 multimode fibres
- Part 2-30: Sectional specification for category A3 multimode fibres
- Part 2-40: Sectional specification for category A4 multimode fibres
- Part 2-50: Sectional specification for class B single-mode fibres

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

OPTICAL FIBRES -

Part 2-40: Product specifications – Sectional specification for category A4 multimode fibres

1 Scope and object

This part of IEC 60793-2 is applicable to optical fibre categories A4a, A4b, A4c, A4d, A4e, A4f, A4g and A4h. These fibres have a plastic core and plastic cladding and may have step-index, multi-step index, or graded-index profiles. The fibres are used in information transmission equipment and optical fibre cables. Table 1 summarizes some of the salient characteristics and applications of these fibres.

Table 1 – Characteristics and applications of category A4 fibres

Characteristics and applications	Types of category A4 fibres							
	A4a	A4b	A4c	A4d	A4e	A4f	A4g	A4h
Core diameter μm	a	a	a	a	≥ 500	200	120	62,5
Cladding diameter μm	1 000	750	500	1 000	750	490	490	245
Numerical aperture	0,50 ^t	0,50 ^t	0,50 ^t	0,30 ^t	0,25 ^t	0,190 ^e	0,190 ^e	0,190 ^e
Operating wavelength(s) nm	650	650	650	650	650	650, 850, 1 300	650, 850, 1 300	850, 1 300
Applications	Digital audio interface, automobile, industrial and sensor	Industrial and sensor	Sensor	Digital audio/visual interface and data transmission	Digital audio/visual interface and data transmission	Industrial and mobile; compatible with A3 transmission equipment	Data transmission	Data transmission; primarily used in ribbon structures
NOTE ^t = theoretical; ^e = measured effective								
^a Typically 15 to 35 μm smaller than the cladding diameter								

In addition to the applications shown in Table 1, other applications for A4 fibres include, but are not restricted to, the following: support for short reach high bit-rate systems in telephony, distribution and local networks, carrying data, voice and/or video services and on-premises intrabuilding and interbuilding fibre installations, including LANs, PBXs, video, various multiplexing uses, and miscellaneous related uses, such as consumer electronics and industrial and mobile networks.

Informative Annex J shows typical characteristics and requirements for some buffered A4 fibres. The actual requirements are specified in the buffered fibre document IEC 60794-2-41.

Three types of requirements apply to A4 fibres:

- general requirements, as defined in IEC 60793-2;
- specific requirements common to category A4 multimode fibres covered in this standard and that are given in Clause 3;
- particular requirements applicable to individual fibre types or specific applications and that are defined in this standard in the normative family specification annexes.

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 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60793-1 (all parts), *Optical fibres – Part 1: Measurement methods and test procedures*

IEC 60793-1-20, *Optical fibres – Part 1-20: Measurement methods and test procedures – Fibre geometry*

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 60793-1-41, *Optical fibres – Part 1-41: Measurement methods and test procedures – Bandwidth*

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

IEC 60793-1-43, *Optical fibres – Part 1-43: Measurement methods and test procedures – Numerical aperture*

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

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

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

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