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Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibre (IEC 60793-2-10:2015)

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EUROPEAN STANDARD

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NORME EUROPÉENNE

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February 2016

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English Version

**Optical fibres - Part 2-10: Product specifications - Sectional
specification for category A1 multimode fibre
(IEC 60793-2-10:2015)**

Fibres optiques - Partie 2-10: Spécifications de produits -
Spécification intermédiaire pour les fibres multimodales de
catégorie A1
(IEC 60793-2-10:2015)

Lichtwellenleiter - Teil 2-10: Produktspezifikationen -
Rahmenspezifikation für Mehrmodenfasern der
Kategorie A1
(IEC 60793-2-10:2015)

This European Standard was approved by CENELEC on 2015-12-24. 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 CEN-CENELEC Management Centre or to any CENELEC member.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 60793-2-10:2016**European foreword**

The text of document 86A/1631/CDV, future edition 5 of IEC 60793-2-10, prepared by SC 86A "Fibres and cables" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60793-2-10:2016.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-09-24
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-12-24

This document supersedes EN 60793-2-10:2011.

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The text of the International Standard IEC 60793-2-10:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

| | | |
|---------------|------|-----------------------------|
| IEC 61280-1-4 | NOTE | Harmonized as EN 61280-1-4. |
| IEC 61280-1-3 | NOTE | Harmonized as EN 61280-1-3. |
| IEC 60793-1-1 | NOTE | Harmonized as EN 60793-1-1. |
| IEC 60794-1-1 | NOTE | Harmonized as EN 60794-1-1. |

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|--|---------------|-------------|
| IEC 60793-1 | series | Optical fibres - Part 1: Measurement methods and test procedures | EN 60793-1 | series |
| IEC 60793-1-20 | - | Optical fibres - Part 1-20: Measurement methods and test procedures - Fibre geometry | EN 60793-1-20 | - |
| IEC 60793-1-21 | - | Optical fibres - Part 1-21: Measurement methods and test procedures - Coating geometry | EN 60793-1-21 | - |
| IEC 60793-1-22 | - | Optical fibres - Part 1-22: Measurement methods and test procedures - Length measurement | EN 60793-1-22 | - |
| IEC 60793-1-30 | - | Optical fibres - Part 1-30: Measurement methods and test procedures - Fibre proof test | EN 60793-1-30 | - |
| IEC 60793-1-31 | - | Optical fibres - Part 1-31: Measurement methods and test procedures - Tensile strength | EN 60793-1-31 | - |
| IEC 60793-1-32 | - | Optical fibres - Part 1-32: Measurement methods and test procedures - Coating strippability | EN 60793-1-32 | - |
| IEC 60793-1-33 | - | Optical fibres - Part 1-33: Measurement methods and test procedures - Stress corrosion susceptibility | EN 60793-1-33 | - |
| IEC 60793-1-34 | - | Optical fibres - Part 1-34: Measurement methods and test procedures - Fibre curl | EN 60793-1-34 | - |
| IEC 60793-1-40 | - | Optical fibres - Part 1-40: Measurement methods and test procedures - Attenuation | EN 60793-1-40 | - |

EN 60793-2-10:2016

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|--|---------------|-------------|
| IEC 60793-1-41 | - | Optical fibres - Part 1-41: Measurement methods and test procedures - Bandwidth | EN 60793-1-41 | - |
| IEC 60793-1-42 | - | Optical fibres - Part 1-42: Measurement methods and test procedures - Chromatic dispersion | EN 60793-1-42 | - |
| IEC 60793-1-43 | - | Optical fibres - Part 1-43: Measurement methods and test procedures - Numerical aperture measurement | EN 60793-1-43 | - |
| IEC 60793-1-46 | - | Optical fibres - Part 1-46: Measurement methods and test procedures - Monitoring of changes in optical transmittance | EN 60793-1-46 | - |
| IEC 60793-1-47 | - | Optical fibres - Part 1-47: Measurement methods and test procedures - Macrobending loss | EN 60793-1-47 | - |
| IEC 60793-1-49 | - | Optical fibres - Part 1-49: Measurement methods and test procedures - Differential mode delay | EN 60793-1-49 | - |
| IEC 60793-1-50 | - | Optical fibres - Part 1-50: Measurement methods and test procedures - Damp heat (steady state) tests | EN 60793-1-50 | - |
| IEC 60793-1-51 | - | Optical fibres - Part 1-51: Measurement methods and test procedures - Dry heat (steady state) tests | EN 60793-1-51 | - |
| IEC 60793-1-52 | - | Optical fibres - Part 1-52: Measurement methods and test procedures - Change of temperature tests | EN 60793-1-52 | - |
| IEC 60793-1-53 | - | Optical fibres - Part 1-53: Measurement methods and test procedures - Water immersion tests | EN 60793-1-53 | - |
| IEC 60793-2 | 2011 | Optical fibres - Part 2: Product specifications - General | EN 60793-2 | 2012 |
| IEC 61280-4-1 | - | Fibre optic communication subsystem test procedures - Part 4-1: Installed cable plant - Multimode attenuation measurement | EN 61280-4-1 | - |
| IEC/TR 61931 | - | Fibre optic - Terminology | - | - |



INTERNATIONAL STANDARD

NORME INTERNATIONALE



Optical fibres – iTeh STANDARD PREVIEW
Part 2-10: Product specifications – Sectional specification for category A1
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Fibres optiques –
Partie 2-10: Spécifications de produits – Spécification intermédiaire pour les
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OPTICAL FIBRES –

**Part 2-10: Product specifications –
Sectional specification for category A1 multimode fibres**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60793-2-10 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This fifth edition cancels and replaces the fourth edition published in 2011. This edition constitutes a technical revision.

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

- a) addition of enhanced macrobending multimode fibres A1a.1b, A1a.2b and A1a.3b;
- b) inclusion of the specified test wavelength and specimen length for core diameter (CD), numerical aperture (NA), differential mode delay (DMD) and threshold values for CD and NA;
- c) addition of a specimen length for 850 nm bandwidth of A1a and A1b fibres.

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

| CDV | Report on voting |
|--------------|------------------|
| 86A/1631/CDV | 86A/1664/RVC |

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.

A list of all parts in the IEC 60793 series, published under the general title *Optical fibres*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

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OPTICAL FIBRES –

Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres

1 Scope

This part of IEC 60793 is applicable to optical fibre types A1a, A1b, and A1d. These fibres are used or can be incorporated in information transmission equipment and optical fibre cables.

Type A1a applies to 50/125 μm graded index fibre. Three bandwidth grades are defined as A1a.1, A1a.2 and A1a.3. Each of these bandwidth grades is defined for two levels of macrobend loss performance that are distinguished by “a” or “b” suffix. Those with suffix “a” are specified to meet traditional macrobend loss performance levels. Those with suffix “b” are specified to meet enhanced macrobend loss (i.e. lower loss) performance levels.

Type A1b applies to 62,5/125 μm graded index fibre and A1d applies to 100/140 μm graded index fibre.

Other applications include, but are not restricted to, the following: short reach, high bit-rate systems in telephony, distribution and local networks carrying data, voice and/or video services; on-premises intra-building and inter-building fibre installations including data centres, local area networks (LANs), storage area networks (SANs), private branch exchanges (PBXs), video, various multiplexing uses, outside telephone cable plant use, and miscellaneous related uses.

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Three types of requirements apply to these fibres:

- general requirements, as defined in IEC 60793-2;
- specific requirements common to the category A1 multimode 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 normative family specification annexes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 (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 60793-1-21, *Optical fibres – Part 1-21: Measurement methods and test procedures – Coating geometry*

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