IEC 60793-2-30

Edition 3.0 2012-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Optical fibres –
Part 2-30: Product specifications – Sectional specification for category A3 multimode fibres

Fibres optiques –
Partie 2-30: Spécifications de produits – Spécification intermédiaire pour les fibres multimodales de catégorie A3

IEC 60793-2-30:2012

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX

R

ICS 33.180.10

ISBN 978-2-8322-0929-5

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 60793-2-30 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This third edition cancels and replaces the second edition, published in 2007. It constitutes a technical revision.

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

– addition of a new sub-category A3e;
– changed unit for core-cladding concentricity error and proof stress level.

This bilingual version (2013-07) corresponds to the monolingual English version, published in 2012-10.

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

CDV	Report on voting
86A/1414/CDV	86A/1434/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.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of 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 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- withdrawn,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.

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OPTICAL FIBRES –

Part 2-30: Product specifications – Sectional specification for category A3 multimode fibres

1 Scope

This part of IEC 60793-2 is applicable to sub-categories A3a, A3b, A3c, A3d and A3e. These fibres are used or can be incorporated in different information transmission equipments, other applications employing similar light transmitting techniques, and finally fibre optic cables.

Three types of requirements apply to these fibres:

- general requirements, as defined in IEC 60793-2;
- specific requirements common to the category A3 multimode fibres covered in this standard and which are given in Clause 3;
- particular requirements applicable to the individual sub-categories or specific applications (e.g. automotive or industrial applications), which are defined in the normative sub-category 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 60793-1-20, *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*

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

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

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

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*

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

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

3 Specifications

3.1 General

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

3.2 Dimensional requirements

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

Dimensional requirements common to all sub-categories are indicated in Table 2.

Table 3 lists additional dimensional attributes that shall be specified for each sub-category.

Table 1 – Relevant dimensional attributes and measurement methods

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

Table 2 – Dimensional requirements common to all category A3 fibres

Attributes	Unit	Limits
Fibre length	km	[a]
[a] Length requirements vary and should be agreed between supplier and customer.		

Table 3 – Additional dimensional attributes required for each sub-category

Attributes
Core diameter
Core non-circularity
Cladding diameter
Core-cladding concentricity error
Coating diameter

3.3 Mechanical requirements

Relevant mechanical attributes and test methods are given in Table 4.

Requirements to be specified for each sub-category are listed in Table 5.

Table 4 – Relevant mechanical attributes and test methods

Attribute	Test method
Tensile strength	IEC 60793-1-31 (0,5 m sample length) Strain rate 3 % to 5 %/min
Proof test	IEC 60793-1-30

Table 5 – Mechanical requirements to be specified for each sub-category

Attribute	Unit
Proof stress level	GPa

3.4 Transmission requirements

Relevant transmission attributes and measurement methods are given in Table 6.

Additional attributes required in the sub-categories are listed in Table 7.

Table 6 – Relevant transmission attributes and measurement methods

Attribute	Measurement method
Attenuation coefficient[a]	IEC 60793-1-40
Modal bandwidth[a]	IEC 60793-1-41
Theoretical numerical aperture	IEC 60793-1-20
Change of optical transmission	IEC 60793-1-46
[a] When measuring attenuation and modal bandwidth, the appropriate launching conditions should be applied, as specified in IEC 60793-1-40 and IEC 60793-1-41. Attenuation and bandwidth are not necessarily linear with length.	

Table 7 – Additional transmission attributes required for each sub-category

Attributes
Attenuation coefficient
Modal bandwidth
Theoretical numerical aperture

3.5 Environmental requirements

Relevant environmental attributes and test methods are given in Table 8.

Table 8 – Relevant environmental attributes and test methods

Attributes	Test methods
Damp heat tests	IEC 60793-1-50
Dry heat tests	IEC 60793-1-51
Change of temperature tests	IEC 60793-1-52

Annex A
(normative)

Specifications for sub-category A3a multimode fibres

A.1 General

The following clauses and tables contain particular requirements applicable to A3a fibres. Common requirements, repeated here for ease of reference from the sectional specification, are noted by an entry in the “Reference” column.

A.2 Dimensional requirements

Table A.1 contains dimensional requirements specific to A3a fibres.

Table A.1 – Dimensional requirements specific to A3a fibres

Attributes	Unit	Limits	Reference
Core diameter	µm	200 ± 8	
Core non-circularity	%	≤6	
Cladding diameter	µm	300 ± 30	
Core-cladding concentricity error	µm	≤20	
Coating diameter	µm	900 ± 50	
Fibre length	km	(See 3.2)	3.2

A.3 Mechanical requirements

Table A.2 contains mechanical requirements specific to A3a fibres.

Table A.2 – Mechanical requirements specific to A3a fibres

Attribute	Unit	Limit	Reference
Proof stress level	GPa	≥0,345	
The normative proof test stress value of 0,345 GPa equals about 0,5% strain or about 11,7 N force (for the largest allowed core diameter). For the relation between these different units, see 7.4 of IEC/TR 62048:2011 [1][1].			

1 References in square brackets refer to the Bibliography.

A.4 Transmission requirements

Table A.3 contains transmission requirements specific to A3a fibres.

Table A.3 – Transmission requirements specific to A3a fibres

Attributes	Unit	Limits	Reference
Attenuation coefficient at 850 nm	dB/km	≤ 10	
Modal bandwidth at 850 nm	MHz × km	≥ 5	
Theoretical numerical aperture	Unitless	0,40 ± 0,04	

A.5 Environmental requirements

None.