

INTERNATIONAL STANDARD

**Optical fibre cables –
Part 2-40: Indoor optical fibre cables – Family specification for A4 fibre cables**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL FIBRE CABLES –

**Part 2-40: Indoor optical fibre cables –
Family specification for A4 fibre cables**

FOREWORD

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International Standard IEC 60794-2-40 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2003, of which it constitutes a technical revision. In addition to covering buffered A4 fibres, as did the first edition, this second edition now also covers cabled A4 fibres.

This standard is to be used in conjunction with IEC 60794-1-1, IEC 60794-1-2 and IEC 60794-2.

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

CDV	Report on voting
86A/1124A/CDV	86A/1153/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 of the IEC 60794 series, published under the general title *Optical fibre cables*, can be found on the IEC website.

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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

OPTICAL FIBRE CABLES –

Part 2-40: Indoor optical fibre cables – Family specification for A4 fibre cables

1 Scope

This part of IEC 60794 is a family specification covering buffered A4 fibres and cabled A4 fibres for indoor use. See IEC 60794-2-41 and IEC 60794-2-42 for blank detail specifications.

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.

NOTE The normative references given in IEC 60794-1-1 and IEC 60794-1-2 are also of interest.

IEC 60189-1, *Low-frequency cables and wires with PVC insulation and PVC sheath – Part 1: General test and measuring methods.*

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 60793-2-40, *Optical fibres – Part 2-40: Product specifications – Sectional specification for category A4 multimode fibres*

IEC 60794-1-1, *Optical fibre cables – Part 1-1: Generic specification – General*

IEC 60794-1-2, *Optical fibre cables – Part 1-2: Generic specification – Basic optical cable test procedures*

IEC 60794-2, *Indoor cables – Sectional specification*

3 Construction

3.1 General

In addition to the constructional requirements in IEC 60794-2, the following considerations apply to A4 fibre cables.

The cable shall be designed and manufactured so that the expected operating lifetime would be at least 15 years. In this context, the attenuation of the installed cable at the operational wavelength(s) shall not exceed values agreed between the customer and supplier. The materials in the cable shall not present a health hazard within its intended use.

There shall be no fibre splice in a delivery length unless otherwise agreed by the customer and supplier.

It shall be possible to identify each individual fibre throughout the length of the cable.

3.2 Optical fibres

Multimode category A4 optical fibres shall be used that meet the requirements of IEC 60793-2-40.

3.3 Buffer

The buffer, if any, shall consist of one or more layers of inert material. For tight buffer, the buffer shall be easily removable in one operation over a length of 15 mm to 25 mm, depending on customer requirements. For semi-tight buffers, the buffer shall be easily removable over a length of 0,2 m to 2,0 m.

3.4 Tube

See product specification.

3.5 Strength and anti-buckling members

See product specification.

3.6 Ripcord

For future study.

3.7 Ribbon

None.

3.8 Sheath

See product specification.

3.9 Marking

If required, the buffer and/or the sheath shall be marked as agreed between the customer and the supplier.

3.10 Identification

See product specification.

3.11 Examples of construction

See product specification.

4 Dimensions

See product specification.

5 Tests

Compliance with specification requirements shall be verified by carrying out tests selected from the following subclauses. It is not intended that all tests be performed; the frequency of testing shall be agreed between the customer and supplier.

Unless otherwise specified, all tests shall be carried out at ambient temperature.

5.1 Dimensions

The fibre dimensions and tolerances shall be checked in accordance with test method IEC 60793-1-20 and IEC 60793-1-21. The diameter of the buffer and of the cable, as well as the thickness of the sheath, shall be measured in accordance with the methods of IEC 60189-1.

5.2 Mechanical requirements

Some of the following tests, which are detailed in IEC 60794-1-2, can be performed on a short sample length of cable that is still an integral part of a longer length. Thus it becomes possible to detect permanent changes in attenuation. The maximum value of this attenuation change shall be agreed between the customer and supplier.

Table 1 shows mechanical tests performed. The test methods, test parameters and requirements are specified in the product specification.

Table 1 – Mechanical tests

Attribute	Reference
Tensile performance	IEC 60794-1-2-E1A IEC 60794-1-2-E1B
Crush	IEC 60794-1-2-E3
Impact	IEC 60794-1-2-E4
Bend	IEC 60794-1-2-E11A
Repeated bending	IEC 60794-1-2-E6
Bend at low temperature	IEC 60794-1-2-E11A
Flexing	IEC 60794-1-2-E8
Torsion	IEC 60794-2-E7
Kink	IEC 60794-1-2-E10

5.3 Environmental requirements

Environmental exposure testing of unbuffered fibre is required only when the fibre is sold in unbuffered form. Otherwise, environmental testing is performed on the completed product after the fibres are buffered or cabled. The test methods, test conditions, and requirements are specified in the product specification.

5.4 Transmission requirements

The transmission requirements shall be in accordance with IEC 60793-2-40 and shall be agreed between the customer and supplier.

5.5 Fire performance

IEC/TR 62222 provides guidance and recommendations for the requirements and test methods for the fire performance of communication cables when installed in buildings. The recommendations relate to typical applications and installation practices, and an assessment of the fire hazards presented. Applicable legislation and regulation are also taken into account.

IEC/TR 62222 references several IEC fire performance test methods and also other test methods that may be required by local or national legislation and regulation. The tests to be applied, and the requirements, shall be agreed between the customer and supplier taking into account the fire hazard presented by the end use application in which the cable is intended to be used.

Bibliography

IEC/TR 62222: *Fire performance of communication cables installed in buildings*

IEC 60794-2-41, *Optical fibre cables – Part 2-41: Indoor optical fibre cables – Product specification for simplex and duplex buffered A4 fibres*¹

IEC 60794-2-42, *Optical fibre cables – Part 2-42: Indoor optical fibre cables – Product specification for simplex and duplex cables with A4 fibres*¹

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