

# INTERNATIONAL STANDARD

**Optical fibre cables –  
Part 2-30: Indoor cables – Family specification for ribbon cables**

IEC 60794-2-30:2008  
<https://standards.iteh.ai/standards/sist/5d0c4b5c-a461-4370-a130-3347aba87c4e/iec-60794-2-30-2008>

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IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland  
Email: [inmail@iec.ch](mailto:inmail@iec.ch)  
Web: [www.iec.ch](http://www.iec.ch)

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Email: [csc@iec.ch](mailto:csc@iec.ch)  
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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## OPTICAL FIBRE CABLES –

**Part 2-30: Indoor cables –  
Family specification for ribbon cables**

## FOREWORD

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International Standard IEC 60794-2-30 has been prepared by sub-committee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2003. It constitutes a technical revision. The main changes are listed below:

- a) subclause 5.4 has been detailed according to the fibre type;
- b) Annex A has been added to show an example of cable construction;
- c) Annex B has been added which is a blank detail specification including Mice classification and requirements;
- d) a bibliography has been added

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

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

FDIS	Report on voting
86A/1233/FDIS	86A/1244/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.

A list of all parts of 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- withdrawn,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 2-30: Indoor cables – Family specification for ribbon cables

#### 1 Scope

This part of IEC 60794 is a family specification which covers optical fibre ribbon cables for indoor use. The requirements of the sectional specification IEC 60794-2 are applicable to cables covered by this standard.

Clause B.2 contains requirements that supersede the normal requirements in case the cables are intended to be used in installations governed by the MICE table of ISO/IEC 24702.

#### 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.

These documents complete the normative references already listed in the generic specification (IEC 60794-1-1, Clause 2, and IEC 60794-1-2, Clause 2) or in the sectional specification (IEC 60794-2, Clause 2).

IEC 60304:1982, *Standard colours for insulation for low-frequency cables and wires.*

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

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

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

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

IEC 60793-2-10, *Optical fibres – Part 2-10, Product specifications – Sectional specification for category A1 multimode fibres*

IEC 60794-1-1, *Optical fibre cables – Part 1-1: Generic specification – General 86A/1054/NP*

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

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

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

IEC 60811-1-1:1993, *Common test methods for insulating and sheathing materials of electric cables and optical cables – Part 1-1: Methods for general application – Measurement of thickness and overall dimensions – Tests for determining the mechanical properties*



IEC 60811-1-4:1985, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section Four: Tests at low temperatures.*

### 3 Construction

#### 3.1 General

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

The cable shall be designed and manufactured for a predicted operating lifetime of 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 the 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 the supplier.

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

#### 3.2 Optical fibres and primary coating

Multimode or single-mode optical fibres meeting the requirements of IEC 60793-2 shall be used.

#### 3.3 Buffer

None.

#### 3.4 Ruggedized fibre

None.

#### 3.5 Slotted core

None.

#### 3.6 Tube

None.

#### 3.7 Stranded loose tube

None.

#### 3.8 Ribbon structure

The ribbon structure shall conform to 6.5 and 8.2.3 of IEC 60794-3. Fibres shall be formed into units of typically two, four, six, eight, or twelve fibres each. The fibres within the units shall remain parallel and not cross over. An example of a ribbon construction is shown in Figure A.1

#### 3.9 Strength and anti-buckling members

The optical fibre ribbon cable may incorporate a tensile strength member. The strength member can be a layer of suitable material, longitudinally or helically applied, and/or may be embedded in the overall sheath.

### 3.10 Ripcord

None.

### 3.11 Sheath

The optical fibre ribbon shall be uniformly covered with a protective sheath generally as shown in Figure A.1.

### 3.12 Sheath marking

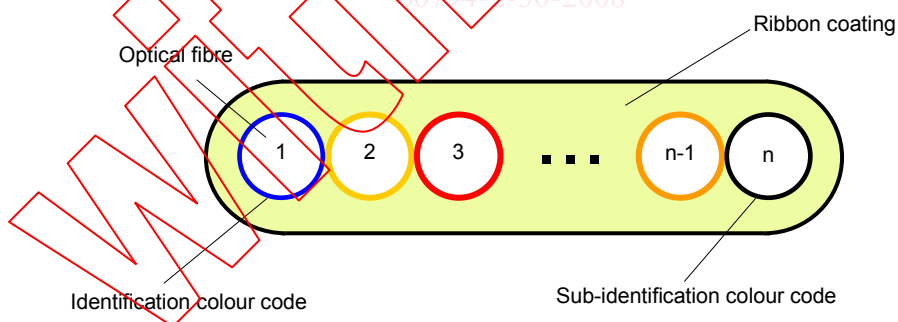
If required, the cable shall be marked as agreed between the customer and the supplier.

### 3.13 Identification

The coated fibre shall be distinguishable by means of colour coding and positioning. For example (see Figure 1):

- a) a fibre ribbon has an identification coloured fibre on one side and a sub-identification coloured one on the other side;
- b) the identification and the sub-identification coloured fibres are the first and the last in the fibre ribbon, respectively;
- c) any colour of the identification colours group is different from that of the sub-identification colours group;
- d) the colour types and the order used for identification and sub-identification should be agreed between the customer and the supplier. The colours of the other fibres shall be agreed by the customer and/or the supplier;
- e) the colour range used is similar to the first 12 colours described in Table 1 of IEC 60794-2, i.e. blue, yellow, red, white, green, violet, orange, grey, turquoise, black, brown and pink.

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NOTE 1 The identification colour enables each fibre ribbon to be identified individually within a group of ribbons.

NOTE 2 The sub-identification colour shows the ribbon group.

NOTE 3 The identification and the sub-identification colour in a ribbon enables each fibre to be identified individually within the ribbon.

**Figure 1 – Example of identification by means of colour coding and positioning**

Other methods of identification are under consideration.

### 3.14 Example of cable construction

An example of a ribbon cable construction is shown in Figure A.1. Other configurations are not precluded if they meet the mechanical, environmental and transmission requirements given in this specification.

## 4 Dimensions

### 4.1 Optical fibres and primary coating

The dimensions of the individual primary coated fibres in the finished product shall be in accordance with IEC 60793-2.

### 4.2 Ribbon structural geometry

The ribbon geometry shall conform to 8.2.3 of IEC 60794-3.

### 4.3 Optical fibre ribbon cable

Unless otherwise specified, the dimensions and the structural geometry of optical fibre ribbon cables shall be as shown in Table 1.

**Table 1 – Dimensions of optical fibre ribbon cables**

Number of fibres	Optical fibre ribbon cables			
	Width mm		Height mm	
	Nominal	Maximum tolerance	Nominal	Maximum tolerance
2	3,0 - 3,5	± 0,4	2,3 - 2,7	± 0,3
4	3,0 - 3,5	± 0,4	2,3 - 2,7	± 0,3
6	3,5 - 4,0	± 0,4	2,3 - 2,7	± 0,3
8	2,5 - 4,5	± 0,4	0,9 - 3,0	± 0,3
12	3,5 - 5,5	± 0,4	0,9 - 3,0	± 0,3

NOTE These dimensions apply to the ribbon cable including the sheath and any strength members.

## 5 Tests

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

### 5.1 Dimensions

The dimensions and structural geometry of optical fibre ribbon can be verified with a type test described in 8.2.3 of IEC 60794-3 to establish and assure proper control of the ribbon manufacturing process. Once the process is established, and in order to ensure functional performance, the dimensions of ribbons may be controlled and verified, for final inspection purpose, with a dial gauge as described in Method G4 of IEC 60794-1-2. The size of optical fibre ribbon cable, width and height, shall be measured in accordance with the methods of IEC 60811-1-1.

### 5.2 Mechanical requirements

Some of the following tests can be performed on a short sample length of optical fibre ribbon cable which is still an integral part of a longer length. For testing, the force shall be applied on the flat sides of the cable. Thus it becomes possible to detect permanent changes in attenuation. The wavelength and maximum increase in attenuation change can be agreed between the customer and the supplier.