



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 60794-2-10:2022**  
**01-april-2022**

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**Optični kabli - 2-10. del: Notranji optični kabli - Skupinska specifikacija za simpleksne in dupleksne kable**

Optical fibre cables - Part 2-10: Indoor optical fibre cables - Family specification for simplex and duplex cables

Lichtwellenleiterkabel - Teil 2-10: LWL-Innenkabel - Familienspezifikation für Simplex- und Duplexkabel

Câbles à fibres optiques - Partie 2-10: Câbles intérieurs à fibres optiques - Spécification de famille pour les câbles simplex et duplex

**Ta slovenski standard je istoveten z: prEN IEC 60794-2-10:2022**

**ICS:**

33.180.10 (Optična) vlakna in kabli Fibres and cables

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TITLE:

**Optical fibre cables - Part 2-10: Indoor optical fibre cables - Family specification for simplex and duplex cables**

PROPOSED STABILITY DATE: 2025

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## OPTICAL FIBRE CABLES –

Part 2-10: Indoor optical fibre cables –  
Family specification for simplex and duplex cables

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International Standard IEC 60794-2-10 has been prepared by sub-committee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This third edition cancels and replaces the second edition published in 2011. It constitutes a technical revision.

The main changes with respect to the previous edition are as follows:

- Updating of normative references
- Updating of all relevant A1 and B1 fibre category and sub-category designations

This standard is to be used in conjunction with IEC 60794-1-1, IEC 60794-1-2, IEC 60794-1-21, IEC 60794-1-22, IEC 60794-1-23 and IEC 60794-2.

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

FDIS	Report on voting
86A/xxxx/FDIS	86A/xxxx/RVD

129

130 Full information on the voting for the approval of this standard can be found in the report on  
131 voting indicated in the above table.

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

133 A list of all parts of IEC 60794 series, published under the general title *Optical fibre cables*, can  
134 be found on the IEC website.

135 The committee has decided that the contents of this publication will remain unchanged until the  
136 stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to  
137 the specific publication. At this date, the publication will be

- 138 • reconfirmed,
- 139 • withdrawn,
- 140 • replaced by a revised edition, or
- 141 • amended.

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## OPTICAL FIBRE CABLES –

### Part 2-10: Indoor optical fibre cables – Family specification for simplex and duplex cables

#### 153 1 Scope

154 This part of IEC 60794 is a family specification that covers simplex and duplex optical fibre  
155 cables for indoor use except for cables used in terminated assemblies specified by IEC 60794-  
156 2-50. The requirements of the Sectional specification IEC 60794-2 are applicable to cables  
157 covered by this standard.

158 Cables intended for installation in industrial applications specified in ISO/IEC 11801-1, MICE  
159 specifications may be additionally required (see Annex B.2).

#### 160 2 Normative references

161 The following referenced documents are indispensable for the application of this document. For  
162 dated references, only the edition cited applies. For undated references, the latest edition of  
163 the referenced document (including any amendments) applies.

164 IEC 60304, *Standard colours for insulation for low-frequency cables and wires*

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

167 IEC 60793-1-21, *Optical fibres – Part 1-21: Measurement methods and test procedures –  
168 Coating geometry*

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

171 IEC 60793-1-44, *Optical fibres – Part 1-44: Measurement methods and test procedures – Cut-  
172 off wavelength*

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

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

176 IEC 60793-2-50, *Optical fibres – Part 2-50: Product specifications – Sectional specification for  
177 class B single-mode fibres*

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

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

181 IEC 60794-1-21, *Optical fibre cables – Part 1-21: Generic specification – Basic optical cable  
182 test procedures – Mechanical tests methods*



183 IEC 60794-1-22, *Optical fibre cables – Part 1-22: Generic specification – Basic optical cable*  
184 *test procedures – Environmental tests methods*

185 IEC 60794-1-23, *Optical fibre cables – Part 1-22: Generic specification – Basic optical cable*  
186 *test procedures - Cable element test methods*

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

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

## 191 3 Construction

### 192 3.1 General

193 In addition to the constructional requirements in IEC 60794-2, the following apply to simplex  
194 and duplex indoor cables.

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

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

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

### 202 3.2 Optical fibres and primary coating

203 Multimode or single-mode optical fibres shall be used which meet the requirements of  
204 IEC 60793-2.

### 205 3.3 Buffer

206 If a buffer is required, it shall consist of one or more layers of inert material. The buffer shall be  
207 easily removable. For tight buffers, the buffer and fibre primary coating shall be removable in  
208 one operation over a minimum length of 15 mm, depending on customer requirements. For  
209 semi-tight buffers, the buffer shall be easily removable over a minimum length of 300 mm. For  
210 loose buffers, the buffer shall be easily removable over a length of not less than 1,0 m.

211 Buffer dimensions are shown in Table 1.

212

213

**Table 1 – Dimensions of buffered fibres**

Buffer type	Nominal diameter mm	Tolerances mm
Semi-tight or loose buffer	0,3 to 1,3	± 0,05
Tight buffer	0,3 to 1,0	± 0,05

214

### 215 3.4 Ruggedised fibre

216 Further protection can be provided to buffered fibres by surrounding one or two of the fibres  
217 with non-metallic strength members within a sheath of suitable material.

### 218 3.5 Slotted core

219 Cables of this construction are not commonly used.

### 220 3.6 Tube

221 One or two primary coated or buffered fibres are packaged (loosely or not) in a tube construction  
222 which may be filled. The tube may be reinforced with a composite wall.

223 If required the suitability of the tube shall be determined by an evaluation of its kink resistance  
224 in accordance with IEC 60794-1-23, Method G7.

### 225 3.7 Stranded loose tube

226 Cables of this construction are not commonly used.

### 227 3.8 Ribbon structure

228 Cables of this construction are not commonly used.

### 229 3.9 Strength and anti-buckling members

230 The cable shall be designed with sufficient strength members to meet installation and service  
231 conditions so that the fibres are not subjected to strain in excess of limits agreed between the  
232 customer and the supplier.

233 The strength and/or anti-buckling member may be either metallic or non-metallic and may be  
234 located in the cable core and/or under the sheath and/or in the sheath.

### 235 3.10 Ripcord

236 Ripcords are not commonly used.

### 237 3.11 Sheath

238 The cable shall have an overall protective sheath. The cable dimension/s shall be specified in  
239 the relevant specification.

### 240 3.12 Sheath marking

241 If required, the cable shall be marked according to the local regulations or the agreement  
242 between the customer and the supplier.

### 243 3.13 Identification

244 In case of duplex cables, the cable design should enable clear polarity identification for each  
245 individual fibre. When fibre colouring is used for identification, standard colours shall be used  
246 as closely as possible (reasonable match) to IEC 60304.

### 247 3.14 Examples of cable constructions

248 Examples of some main types of cable construction are shown in Annex A. Other configurations  
249 are not excluded if they meet the mechanical, environmental and transmission requirements  
250 given in this specification.

## 251 4 Dimensions – Optical fibres and primary coating

252 The dimensions of the individual primary coated fibres in the finished product shall be in  
253 accordance with one of the sectional specifications defined in IEC 60793-2. The fibre  
254 dimensions (e.g. cladding diameter or outer diameter including colouring) shall be verified in  
255 accordance with IEC 60793-1-20 or IEC 60793-1-21.

## 256 5 Tests

### 257 5.1 General

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

261 Unless otherwise specified, all tests shall be carried out at standard atmospheric conditions  
262 according to IEC 60794-1-2..

### 263 5.2 Dimensions

264 The fibre dimensions and tolerances shall be checked in accordance with test method  
265 IEC 60793-1-20 or IEC 60793-1-21. The diameter of the buffer and of the cable, as well as the  
266 thickness of the sheath, shall be measured in accordance with the methods of IEC 60811-1-1.

### 267 5.3 Mechanical requirements

268 Some of the following tests can be performed on a short sample length of cable which is still an  
269 integral part of a longer length. Thus it becomes possible to detect permanent changes in  
270 attenuation. The maximum value of this attenuation change shall be agreed between customer  
271 and supplier.

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#### 272 5.3.1 Tensile performance

273 Method: IEC 60794-1-21, E1

274 Diameter of chuck drums and  
275 transfer devices: not less than 250 mm

276 Rate of transfer device: either 100 mm/min or 100 N/min

277 Load: 75 N applied for 10 min for simplex cables and normal  
278 duplex cables

279 150 N applied for 10 min for duplex cables which consist  
280 of independent simplex cables (NOTE 1)

281 NOTE 1 In case of duplex cables including two simplex cables and bearing the applied tensile force by the strength  
282 members of each simplex cable, e.g. Figures A.5, A.6 (without optional strength member) and A.7, the tensile  
283 requirement for the duplex cable shall be double that for the simplex cable. The rationale is that those simplex cables  
284 may be taken out from the duplex cable and will be independently used.

285 NOTE 2 Requirements of tensile load depends on construction of cables. Lower values may be adopted for some  
286 types of cables e.g. small factor simplex cables.

287  
288 Length of sample: sufficient to achieve the desired accuracy of measure-  
289 ment of attenuation change and shall be agreed between  
290 customer and supplier

291 Requirements: no change in attenuation after the test and there shall be  
292 no damage to the cable elements

293 Fibre strain shall not exceed a value agreed upon  
294 between customer and supplier, however fibre strain