



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 60793-1-1:2022**

**01-marec-2022**

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**Optična vlakna - 1-1. del: Metode merjenja in preskusni postopki - Splošno in navodila**

Optical fibres - Part 1-1: Measurement methods and test procedures - General and guidance

Lichtwellenleiter - Teil 1-1: Messmethoden und Prüfverfahren - Allgemeines und Leitfaden

Fibres optiques - Partie 1-1: Méthodes de mesure et procédures d'essai - Généralités et recommandations

**Ta slovenski standard je istoveten z: prEN IEC 60793-1-1:2022**

**ICS:**

33.180.10 (Optična) vlakna in kabli Fibres and cables

**oSIST prEN IEC 60793-1-1:2022 en**

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# 86A/2166/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

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IEC SC 86A : FIBRES AND CABLES	
SECRETARIAT: France	SECRETARY: Mr Laurent Gasca
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING
<p><b>Attention IEC-CENELEC parallel voting</b></p> <p>The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

**Optical fibres - Part 1-1: Measurement methods and test procedures - General and guidance**

PROPOSED STABILITY DATE: 2026

NOTE FROM TC/SC OFFICERS:

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## OPTICAL FIBRES –

**Part 1-1: Measurement methods and test procedures –  
General and guidance**

## 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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- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60793-1-1 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 2017. This edition constitutes a technical revision.

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

- a) changes in normative references;
- b) renamed clause 10 and addition of documentation related requirements in a new sub-clause 10.2

72 The text of this International Standard is based on the following documents:

CDV	Report on voting
86A/xxxx/CDV	86A/xxxx/RVC

73  
74 Full information on the voting for the approval of this International Standard can be found in the  
75 report on voting indicated in the above table.

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

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

79 The committee has decided that the contents of this document will remain unchanged until the  
80 stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to  
81 the specific document. At this date, the document will be

- 82 • reconfirmed,
- 83 • withdrawn,
- 84 • replaced by a revised edition, or
- 85 • amended.

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## iTeh STANDARD

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

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## INTRODUCTION

90 Publications in the IEC 60793-1 series concern measurement methods and test procedures as  
91 they apply to optical fibres.

92 Within the same series, several different areas are grouped, as follows:

93 Parts 1-10 to 1-19: General

94 Parts 1-20 to 1-29: Measurement methods and test procedures for dimensions

95 Parts 1-30 to 1-39: Measurement methods and test procedures for mechanical  
96 characteristics

97 Parts 1-40 to 1-49: Measurement methods and test procedures for transmission and optical  
98 characteristics

99 Parts 1-50 to 1-59: Measurement methods and test procedures for environmental  
100 characteristics

101 Parts 1-60 to 1-69: Measurement methods and test procedures for polarization-maintaining  
102 fibres.

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## OPTICAL FIBRES –

### Part 1-1: Measurement methods and test procedures – General and guidance

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#### 111 **1 Scope**

112 This part of IEC 60793 lists and gives guidance on the use of documents giving the uniform  
113 requirements for measuring and testing optical fibres, thereby assisting in the inspection of  
114 fibres and cables for commercial (mostly telecommunications) purposes.

115 The individual measurement and test methods are contained in the different parts of the  
116 IEC 60793 series. They are identified as IEC 60793-1-X, where "X" is an assigned sub-part  
117 number, indicating its affiliation to the IEC 60793-1 series.

118 In general, measurements and tests methods apply to all class A multimode fibres and class B  
119 and class C single-mode optical fibres covered by IEC 60793-2 (all parts) relating to product  
120 specifications, although there can be exceptions. Clause 1 of each part of the IEC 60793 series  
121 contains the scope for each particular attribute.

#### 122 **2 Normative references**

123 The following documents are referred to in the text in such a way that some or all of their content  
124 constitutes requirements of this document. For dated references, only the edition cited applies.  
125 For undated references, the latest edition of the referenced document (including any  
126 amendments) applies.

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

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

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

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

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

137 IEC 60793-1-32, *Optical fibres – Part 1-32: Measurement methods and test procedures –*  
138 *Coating strippability*

139 IEC 60793-1-33, *Optical fibres – Part 1-33: Measurement methods and test procedures – Stress*  
140 *corrosion susceptibility*

141 IEC 60793-1-34, *Optical fibres – Part 1-34: Measurement methods and test procedures – Fibre*  
142 *curl*

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

145 IEC 60793-1-41, *Optical fibres – Part 1-41: Measurement methods and test procedures –*  
146 *Bandwidth*

147 IEC 60793-1-42, *Optical fibres – Part 1-42: Measurement methods and test procedures –*  
148 *Chromatic dispersion*

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- 149 IEC 60793-1-43, *Optical fibres – Part 1-43: Measurement methods and test procedures –*  
150 *Numerical aperture measurement*
- 151 IEC 60793-1-44, *Optical fibres – Part 1-44: Measurement methods and test procedures – Cut-*  
152 *off wavelength*
- 153 IEC 60793-1-45, *Optical fibres – Part 1-45: Measurement methods and test procedures – Mode*  
154 *field diameter*
- 155 IEC 60793-1-46, *Optical fibres – Part 1-46: Measurement methods and test procedures –*  
156 *Monitoring of changes in optical transmittance*
- 157 IEC 60793-1-47, *Optical fibres – Part 1-47: Measurement methods and test procedures –*  
158 *Macrobending loss*
- 159 IEC 60793-1-48, *Optical fibres – Part 1-48: Measurement methods and test procedures –*  
160 *Polarization mode dispersion*
- 161 IEC 60793-1-49, *Optical fibres – Part 1-49: Measurement methods and test procedures –*  
162 *Differential mode delay*
- 163 IEC 60793-1-50, *Optical fibres – Part 1-50: Measurement methods and test procedures – Damp*  
164 *heat (steady state) tests*
- 165 IEC 60793-1-51, *Optical fibres – Part 1-51: Measurement methods and test procedures – Dry*  
166 *heat (steady state) tests*
- 167 IEC 60793-1-52, *Optical fibres – Part 1-52: Measurement methods and test procedures –*  
168 *Change of temperature tests*
- 169 IEC 60793-1-53, *Optical fibres – Part 1-53: Measurement methods and test procedures – Water*  
170 *immersion tests*
- 171 IEC 60793-1-54, *Optical fibres – Part 1-54: Measurement methods and test procedures –*  
172 *Gamma irradiation*
- 173 IEC 60793-1-60, *Optical fibres – Part 1-60: Measurement methods and test procedures – Beat*  
174 *length*
- 175 IEC 60793-1-61, *Optical fibres – Part 1-61: Measurement methods and test procedures –*  
176 *Polarization crosstalk*
- 177 IEC 60793-2, *Optical fibres – Product specifications – General*

### 178 **3 Terms and definitions**

179 For the purposes of this document, the following terms and definitions apply.

180 ISO and IEC maintain terminological databases for use in standardization at the following  
181 addresses:

- 182 • IEC Electropedia: available at <http://www.electropedia.org/>
- 183 • ISO Online browsing platform: available at <http://www.iso.org/obp>

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## 186 4 Rounding rules

187 All reported test results shall follow the conventional rounding rule<sup>1</sup> of "rounding half away from  
188 zero", when the results recorded display more than the significant number of digits required in  
189 the acceptance criteria. Only the first digit beyond the number of significant digits is used in  
190 determining the rounding.

191 EXAMPLE 1 Against a requirement of 0,22 dB/km maximum attenuation, values up to 0,224 dB/km conform, whilst  
192 values of 0,225 dB/km and above are failures.

193 EXAMPLE 2 Against a requirement of ±0,05 dB, values between –0,054 dB and +0,054 dB are deemed acceptable.

194 EXAMPLE 3 Against a requirement of 0,6 µm maximum core concentricity error, values up to 0,64 µm are  
195 acceptable.

## 196 5 Measurement and test categories

197 The categories include

- 198 a) parameter measurements,
- 199 b) performance measurements, and
- 200 c) compliance tests.

201 According to several different areas, the tests are grouped as follows:

Parts 1-10 to 1-19:

General

Parts 1-20 to 1-29:

Measurement methods and test procedures for dimensions

IEC 60793-1-20

IEC 60793-1-21

IEC 60793-1-22

Parts 1-30 to 1-39:

Measurement methods and test procedures for mechanical characteristics

IEC 60793-1-30

IEC 60793-1-31

IEC 60793-1-32

IEC 60793-1-33

IEC 60793-1-34

Parts 1-40 to 1-49:

Measurement methods and test procedures for transmission and optical characteristics

IEC 60793-1-40

IEC 60793-1-41

IEC 60793-1-42

IEC 60793-1-43

IEC 60793-1-44

IEC 60793-1-45

IEC 60793-1-46

IEC 60793-1-47

IEC 60793-1-48

IEC 60793-1-49

<sup>1</sup> Please see Annex B, Rule B of ISO 80000-1:2009.