
Sistemi za upravljanje z optičnimi vlakni in zaščitna ohišja za optične komunikacijske sisteme - Specifikacije izdelka - 3-1. del: Sistem za upravljanje optičnih elementov, stenska omarica s spojnicami, za kategoriji C in G

Fibre management systems and protective housings to be used in optical fibre communication systems - Product specifications - Part 3-1: Fibre management system, splice wall box, for category C & G

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Systèmes de gestion des fibres et boîtiers de protection destinés à être utilisés dans les systèmes de communication par fibres optiques - Spécifications de produits - Partie 3-1: Boîte de montage mural ou sur poteau pour les épissures, pour les catégories C et A

Ta slovenski standard je istoveten z: prEN 50411-3-1

ICS:

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices
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ICS

Will supersede EN 50411-3-1:2012 and all of its
amendments and corrigenda (if any)

English Version

**Fibre management systems and protective housings to be used
in optical fibre communication systems - Product specifications -
Part 3-1: Fibre management system, splice wall box, for
category C & G**

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communication par fibres optiques - Spécifications de
produits - Partie 3-1: Boîte de montage mural ou sur poteau
pour les épissures, pour les catégories C et A

To be completed

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2021-04-23.

It has been drawn up by CLC/TC 86BXA.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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prEN 50411-3-1:2021 (E)**75 European foreword**

76 This document (prEN 50411-3-1:2021) has been prepared by CLC/TC 86BXA “Fibre optic interconnect,
77 passive and connectorised components”.

78 This document is currently submitted to the Enquiry.

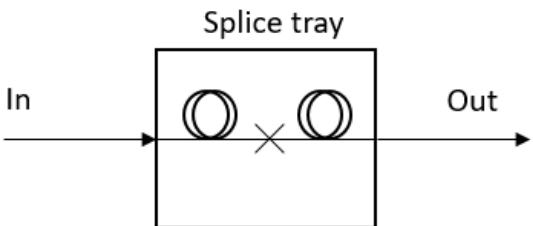
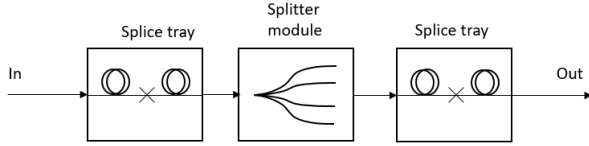
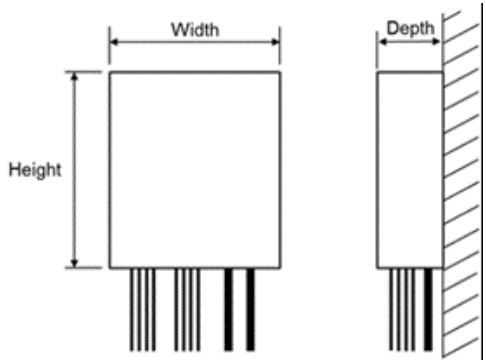
79 The following dates are proposed:

- latest date by which the existence of this document has to be announced at national level (doa) dor + 6 months
- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) dor + 12 months
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) dor + 12 months (to be confirmed or modified when voting)

80 This document will supersede EN 50411-3-1:2012 and all of its amendments and corrigenda (if any).

81 prEN 50411-3-1:2021 includes the following significant technical changes with respect to
82 EN 50411-3-1:2012:

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- 83 — update of the product category in title to Fibre management systems and protective housings;
- 84 — update of the product type in title to wall or pole mounted box for splices;
- 85 — addition of the application for pole mounting;
- 86 — update of the environmental categories to C and A according to EN IEC 61753-1:2018 ed2;
- 87 — update of the definition according to EN IEC 61753-1:2018;
- 88 — update of the description similar to EN 50411-3-4;
- 89 — replacement of the seven tables with box sizes, number of trays and splice capacity with one table
90 reducing the number of sizes to seven;
- 91 — deletion of box sizes V and W;
- 92 — improvement of the description and figures for the example configurations of box test sample
93 preparation;
- 94 — update of the test specifications similar to EN 50411-3-4, that are based on EN IEC 61753-1:2018;
- 95 — removal of the smoke emission test method that was applicable for cables only.

Fibre management systems and protective housings to be used in optical fibre communication systems — Product specifications —						
Part 3–1: Wall or pole mounted box for splices, for category C and A						
Description	Typical installation configuration		Typical mounting options			
Wall or pole mounted box	Track box (2 cables minimum) Spur box (3 cables minimum) Distribution box (6 cables minimum)		Vertical wall (external or internal) Pole mounted (above ground) Inside street furniture (cabinet or pedestals)			
Typical fibre management configurations						
						
Operating service environments						
Applications: Optical fibre cable networks. For indoor and/or for external above ground applications		EN IEC 61753-1, category C EN IEC 61753-1, category A				
Fibre separation levels in Fibre Management System						
Single circuit (1, 2 or 4 fibre splices per tray)		Single ribbon (1 ribbon fibre splice per tray), Single element (6, 8 or 12 fibre splices per tray), Multiple ribbon (12 ribbons fibre splices per tray) Multiple element (144 fibre splices per tray)				
Box sizes, splice capacities and dimensions						
		Box size	Fibre splice capacity max.	Maximum overall box dimensions		
				Width mm	Height mm	Depth mm
		A	24	280	450	100
		G	48	400	450	150
		D	72	400	600	200
		E	96	460	600	180
		K	144	460	610	210
		L	192	420	550	180
		N	288	460	600	180
NOTE Cables enter the box from underneath.						

prEN 50411-3-1:2021 (E)**96 1 Scope****97 1.1 Product definition**

98 This document contains the dimensional, optical, mechanical and environmental performance
99 requirements of a fully installed optical fibre wall or pole mounted box for up to 288 fibre splices, in order
100 for it to be categorized as a European standard product.

101 The typical configuration is splicing of incoming fibres to optional splitters, connecting on the other side
102 to outgoing fibres.

103 A box is a protective housing containing a fibre management system with splice trays of various fibre
104 separation levels. The box can contain one or more of the following:

- 105 — storage and routing for fibre and cable;
- 106 — uncut fibre cable storage;
- 107 — splice trays;
- 108 — passive optical devices (optical splitters or WDM).

109 A box can be installed on a vertical indoor or outdoor surface above ground level. If the box is required
110 to be relocatable with cables attached, the following additional tests are expected to be performed:

- 111 — cable bending;
- 112 — cable torsion.

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113 This document specifies the number of splice trays and splice capacity for each fibre separation level.
114 The maximum capacity is 288 splices. For housings with a higher number of splices, EN 50411-4-1
115 (street cabinets) can be used. [standards.iteh.ai/catalog/standards/sist/0f165f88-7e7e-4131-9c55-](https://standards.iteh.ai/catalog/standards/sist/0f165f88-7e7e-4131-9c55-b23a04edeb53/osist-pren-50411-3-1-2021)

116 Boxes for fibre splice and patchcord connections are covered in EN 50411-3-4.

117 1.2 Operating environment

118 The tests selected, combined with the severity and duration, are representative of indoor and outside
119 plant for above ground environments defined by EN IEC 61753-1:

- 120 — category C: Controlled (indoor) environment;
- 121 — category A: Aerial (outdoor above ground) environment.

122 1.3 Reliability

123 Whilst the anticipated service life expectancy of the product in this environment is 20 years, compliance
124 with this document does not guarantee the reliability of the product. This is expected to be predicted
125 using a recognized reliability assessment programme.

126 1.4 Quality assurance

127 Compliance with this document does not guarantee the manufacturing consistency of the product. This
128 is expected to be maintained using a recognized quality assurance programme.

129 1.5 Allowed fibre and cable types

130 This box standard accommodates EN 60793-2-50 single-mode fibres and EN 60793-2-10 A1-OM2 to
131 A1-OM5 and A1-OM1 multimode fibres and all EN 60794 series optical fibre cables with various fibre
132 capacities, types and designs.

133 **2 Normative references**

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

137 EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

138 EN 60695-11-10, *Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test
 139 methods (IEC 60695-11-10)*

140 EN 60754-1, *Test on gases evolved during combustion of materials from cables - Part 1: Determination
 141 of the halogen acid gas content (IEC 60754-1)*

142 EN 60793-2-10, *Optical fibres - Part 2-10: Product specifications - Sectional specification for category
 143 A1 multimode fibres (IEC 60793-2-10)*

144 EN IEC 60793-2-50, *Optical fibres - Part 2-50: Product specifications - Sectional specification for class
 145 B single-mode fibres (IEC 60793-2-50)*

146 EN 61300-2-1, *Fibre optic interconnecting devices and passive components - Basic test and
 147 measurement procedures - Part 2-1: Tests - Vibration (sinusoidal) (IEC 61300-2-1)*

148 EN IEC 61300-2-4, *Fibre optic interconnecting devices and passive components - Basic test and
 149 measurement procedures - Part 2-4: Tests - Fibre or cable retention (IEC 61300-2-4)*

150 EN 61300-2-5, *Fibre optic interconnecting devices and passive components - Basic test and
 151 measurement procedures - Part 2-5: Tests - Torsion (IEC 61300-2-5)*

152 EN 61300-2-9, *Fibre optic interconnecting devices and passive components - Basic test and
 153 measurement procedures - Part 2-9: Tests - Shock (IEC 61300-2-9)*

154 EN 61300-2-12, *Fibre optic interconnecting devices and passive components - Basic test and
 155 measurement procedures - Part 2-12: Tests - Impact (IEC 61300-2-12)*

156 EN 61300-2-22, *Fibre optic interconnecting devices and passive components - Basic test and
 157 measurement procedures - Part 2-22: Tests - Change of temperature (IEC 61300-2-22)*

158 EN 61300-2-26, *Fibre optic interconnecting devices and passive components - Basic test and
 159 measurement procedures - Part 2-26: Tests - Salt mist (IEC 61300-2-26)*

160 EN 61300-2-33, *Fibre optic interconnecting devices and passive components - Basic test and
 161 measurement procedures - Part 2-33: Tests - Assembly and disassembly of fibre optic mechanical
 162 splices, fibre management systems and closures (IEC 61300-2-33)*

163 EN 61300-2-34, *Fibre optic interconnecting devices and passive components - Basic test and
 164 measurement procedures - Part 2-34: Tests - Resistance to solvents and contaminating fluids of
 165 interconnecting components and closures (IEC 61300-2-34)*

166 EN 61300-2-37, *Fibre optic interconnecting devices and passive components - Basic test and
 167 measurement procedures - Part 2-37: Tests - Cable bending for fibre optic closures (IEC 61300-2-37)*

168 EN 61300-3-1, *Fibre optic interconnecting devices and passive components - Basic test and
 169 measurement procedures - Part 3-1: Examinations and measurements - Visual examination
 170 (IEC 61300-3-1)*

171 EN 61300-3-3, *Fibre optic interconnecting devices and passive components - Basic test and
 172 measurement procedures - Part 3-3: Examinations and measurements - Active monitoring of changes
 173 in attenuation and return loss (IEC 61300-3-3)*

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174 EN 61300-3-28, *Fibre optic interconnecting devices and passive components - Basic test and*
 175 *measurement procedures - Part 3-28: Examinations and measurements - Transient loss*
 176 *(IEC 61300-3-28)*

177 EN 61756-1, *Fibre optic interconnecting devices and passive components - Interface standard for fibre*
 178 *management systems - Part 1: General and guidance (IEC 61756-1)*

179 3 Terms and definitions

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

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

182 — ISO Online browsing platform: available at <https://www.iso.org/obp>

183 — IEC Electropedia: available at <http://www.electropedia.org/>

184 3.1**185 active fibre****186 live fibre**

187 fibre in an optical circuit or node that is carrying an optical signal

188 3.2**189 box**

190 free breathing protective housing that is permanently attached to a vertical wall or pole

191 Note 1 to entry: A box is not specifically designed to allow cable movement (e.g. torsion, bending) at the cable
 192 ports during operation.

193 3.3**194 cable element**

195 grouping of fibres in the cable sheath

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196 3.4**197 fan-out**

198 passive optical component providing a transition between a single ribbon or single element into
 199 individual fibres

200 3.5**201 fibre management system for fibre splicing**

202 system to control, protect and store splices, passive optical components and fibres from incoming to
 203 outgoing cables

204 Note 1 to entry: A fibre management system is intended for installation within a protective housing.

205 Note 2 to entry: A fibre management systems is often called an “organiser”.

206 3.6**207 free breathing housing**

208 protective housing that allows a free exchange of air with the environment

209 Note 1 to entry: Limited water ingress and/or limited dust ingress is possible. Free breathing housings are not
 210 intended for use in areas that are subject to flooding or water immersion. Free breathing housings are used in aerial
 211 environments for the interconnection of cables.

212 Note 2 to entry: A free breathing housing is not designed to hold a varying overpressure or underpressure caused
 213 by temperature changes or atmospheric pressure changes.

- 214 **3.7**
 215 **microduct**
 216 small, flexible lightweight tube with an outer diameter between 3 mm and 16 mm
- 217 **3.8**
 218 **multiple element**
 219 **ME**
 220 physical fibre separation level consisting of more than one single element
- 221 Note 1 to entry: This separation level has fibres from multiple cable elements on one splice tray and is also called
 222 mass storage. It is the lowest (worst) degree of physical circuit separation.
- 223 **3.9**
 224 **multiple ribbon**
 225 **MR**
 226 multiple element consisting of multiple optical fibres (circuits) arranged in ribbons (fibres in parallel)
 227 which are arranged e.g. in stacks
- 228 **3.10**
 229 **passive optical component**
 230 optical component or assembly which does not require any source of energy for its operation other than
 231 optical input signals, or controls the dynamic or static characteristics of optical signals using a source of
 232 energy
- 233 Note 1 to entry: A passive optical component never generates an optical gain of signal power.
- 234 Note 2 to entry: Examples include optical attenuators and passive branching devices.
- 235 **3.11**
 236 **protective housings**
 237 indoor and outdoor housings utilised for the storage, distribution or protection of one or more cable joints
 238 or passive or active telecom equipment
- 239 Note 1 to entry: Examples of protective housings include: boxes, cabinets, cases, optical distribution frame sub
 240 racks, closures or pedestals. A closure can be either a “sealed closure” or a “free breathing closure”.
- 241 Note 2 to entry: A protective housing contains a fibre management system.
- 242 **3.12**
 243 **single circuit**
 244 **SC**
 245 physical fibre separation level where the optical circuit consists of one fibre (single fibre), or more than
 246 one fibre, providing all services for one subscriber
- 247 Note 1 to entry: This fibre separation level has the fibre(s) of only one customer on one splice tray. It is the highest
 248 (best) degree of physical circuit separation. Single circuit minimizes the disturbance of the operated circuits when
 249 accessing any adjacent circuit.
- 250 **3.13**
 251 **single element**
 252 **SE**
 253 physical fibre separation level in the cable subassembly comprising one or more optical fibres inside a
 254 common covering e.g. in a tube or inside one groove of a grooved cable (slotted core cable)
- 255 Note 1 to entry: A single element provides services to more than one subscriber.
- 256 Note 2 to entry: This fibre separation level has all fibres from a cable element (e.g. loose tube) on one splice tray.
 257 It is an intermediate degree of physical circuit separation (between single circuit and multiple element).

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258 **3.14**
 259 **single ribbon**
 260 **SR**
 261 physical fibre separation level with all fibres grouped in one ribbon

262 Note 1 to entry: Depending on the fibres' deployment, a single ribbon can contain all the fibres of one circuit
 263 (single circuit) or the fibres of more than one circuit (single element).

264 **3.15**
 265 **splice tray**
 266 structure that organises and controls storage of fibre splices in an orderly manner, together with the
 267 associated excess uncabled fibre length

268 Note 1 to entry: A splice tray is a part of the fibre management system.

269 **3.16**
 270 **transient loss**
 271 short term (milliseconds) reversible change of optical transmission characteristics arising from optical
 272 discontinuity, physical defects and modifications of the attenuation (e.g. bend loss) normally caused by
 273 mechanical stress

274 **3.17**
 275 **uncut fibre**
 276 fibres from a continuous cable with the cable sheath removed over a defined length

277 Note 1 to entry: Uncut fibres typically comprise a section of cable where the cable sheath has been removed and
 278 the cable tubes or uncut fibres are cleaned as for installation. These uncut tubes or fibres are then stored, usually
 279 inside a protective housing, in a loop. When required the fibres or tubes are then cut and the fibres connected or
 280 spliced.

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281 4 Abbreviations

282 For the purposes of this document, the following abbreviations apply.

FMS	Fibre Management System
FTTH	Fibre to the Home
ME	Multiple Element
MR	Multiple Ribbon
NA	Not applicable
SC	Single Circuit
SE	Single Element
SR	Single Ribbon
WDM	Wavelength Division Multiplexer

283 5 Description**284 5.1 Functions and configurations**

285 An optical fibre box is a housing that is attached to a wall or pole and contains the ends of the terminated
 286 cables. The design of the box shall allow the interconnection of cable ends or fibre units.

287 A box has a means of containing and protecting the fibres, splices, and other passive optical devices.

288 A box used for blown cabling contains an area where the ends of the micro-ducts or the protected micro-
 289 ducts, which may be terminated with water and gas blocking, are placed.