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Delilniki za optična vlakna in kabelske spojnice za optične komunikacijske sisteme - Specifikacija izdelka - 3-1. del: Sistem za upravljanje optičnih elementov, stenska omarica s spojnicami, za kategoriji C in G

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

To be completed

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This draft European Standard is submitted to CENELEC members for CENELEC enquiry.
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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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CENELEC

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

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Foreword

2 This draft European Standard was prepared by the Technical Committee CENELEC TC 86BXA, Fibre optic
3 interconnect, passive and connectorised components. It is submitted to the CENELEC enquiry.

4

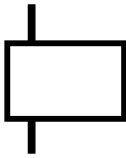
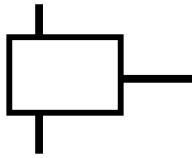
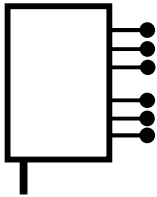
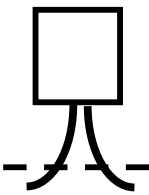
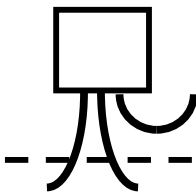
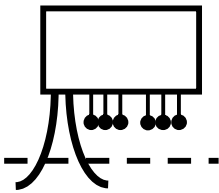


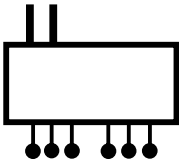
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Fibre organisers and closures to be used in optical fibre communication systems – Product specifications					
Part 3-1: Fibre management system, splice wall box, for category C & G					
Description			Typical installation application		
Construction: Wall mounted box Cable seals: Mechanical cold applied and or heat activated – for category G (outdoors)			Track box (2 cables minimum) Spur box (3 cables minimum) Distribution box (6 cables minimum).		
Performance					
Applications: Optical fibre cable networks For indoor; for external above ground;			IEC 61753-1:2007, category C IEC 61753-1:2007, category G		
Fibre separation level - FMS splice trays:					
Single circuit (>2 fibres per tray), Single element (>12 fibres per tray), Multiple element (>144 fibres per tray)			Single ribbon (>4 fibres per tray), and/or Multiple ribbon (>144 fibres per tray)		
Construction and splice tray capacity:					
FMS –Number splice trays (maximum) – for each fibre separation level – SC, SE, SR, ME and MR					
Number of trays	S organiser			M organiser	
	Single circuit SC	Single element SE	Single ribbon SR	Multiple element ME	Multiple ribbon MR
Typical capacity 12 fibres	6	1	3	1	1
Maximum capacity 288 fibres	144	24	24	2	2(12 f/R)
Minimum no of cable entries	Track box - 2		Spur box - 3		Distribution box - 6
Schematic diagrams (Cable entries can be in any orientation)					
Typical installations A Street cabinet or external configurations					
Typical installations B Office internal configurations					

7

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82 1 Scope

83 1.1 Product definition

84 This specification covers wall boxes for up to 288 fibre splices. Wall boxes for connectors are covered in prEN
85 50411-3-4.

86
87 This specification contains the initial, start of life dimensional, optical, mechanical and environmental
88 performance requirements of a fully installed optical fibre wall box, in order for it to be categorised as an EN
89 standard product.

90
91 The wall box must be suitable for fixing to a vertical internal or external surface above ground level.

92 The wall box is a housing containing a fibre management system, containing splice trays of various fibre
93 separation levels, and may contain one or more of the following:

- 94
95 • storage and/or routing of cable or microduct;
96 • through-box/uncut fibre, cable storage;
97 • passive devices.
98

99 This specification specifies the number of splice trays for each fibre separation level.
100

101 1.2 Minimum bending radius for fibres, microducts tubes and cables. Optical fibre minimum storage 102 bending radius

103
104 The minimum bend radius of fibre depends on its type, and is applicable for all operational wave lengths:
105

- 106 • EN 60793-2-10 Type A1 bare multimode fibre is 30 mm;
107 • EN 60793-2-50:2008, Type B 1.1 and B 1.3 singlemode fibre is 30 mm; (20 mm is accepted for total lengths
108 less than 2 m)
109 • EN 60793-2-50:2008, Type B6 singlemode fibre (ITU-T G.657) is 20 mm (15 mm is accepted for total lengths
110 less than 0.5 m)

111
112 If the minimum bend radius is less refer to the manufacturer's technical product specifications.
113

114 1.3 Operating environment

115 The tests selected combined with the severity and duration is representative of indoor and outside plant for
116 above ground environments defined by:

- 117
118 EN 61753-1:2007 category C Controlled environment
119 category G: Ground level environment

120 1.4 Reliability

121 Whilst the anticipated service life expectancy of the product in this environment is 20 years, compliance with this
122 specification does not guarantee the reliability of the product. This should be predicted using a recognised
123 reliability assessment programme.
124

125 1.5 Quality assurance

126 Compliance with this specification does not guarantee the manufacturing consistency of the product. This should
127 be maintained using a recognised quality assurance programme.
128

129 1.6 Allowed fibre and cable types

130 All types of fibre are permitted for a FMS with a minimum bend radius of 30 mm. A minimum bend of 20 mm can
131 only be used with a B 6 type fibre. The box, once tested according to this product specification, will be also
132 suited for other fibre types like bend insensitive, dispersion shifted, non-zero dispersion shifted and multi-mode
133 fibres.

134 This wall box standard allows both single-mode and multi-mode fibre to be used and covers all IEC standard
135 optical fibre cables with their various fibre capacities, types and designs.
136

137 2 Normative references

138 The following referenced documents are indispensable for the application of this document. For dated
 139 references, only the edition cited applies. For undated references, the latest edition of the referenced document
 140 (including any amendments) applies.
 141

EN 50411-2	Fibre organizers and closures to be used in optical fibre communication systems – Product specification - Part 2: General and guidance for optical fibre cable joint closures, protected microduct closures, and microduct connectors
EN 60529	Degrees of protection provided by enclosures (IP code)
EN 60793-2-50:2008	Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres (IEC 60793-2-50:2008)
EN 60793-2-10	Optical fibres. Part 2-10. Product specifications. Sectional specification for category A1 multimode fibres (IEC 60793-2-10)
EN 60794-2	Optical fibre cables – Part 2: Indoor cables – Sectional specification (IEC 60794-2)
EN 60794-3	Optical fibre cables – Part 2: Outdoor cables – Sectional specification (IEC 60794-3)
EN 61300 series	Fibre optic interconnecting devices and passive components – Basic test and measurement procedures (IEC 61300 series)
EN 61300-2-1	Part 2-1: Tests – Vibration (sinusoidal) ((IEC 61300-2-1)
EN 61300-2-4	Part 2-4: Tests – Fibre/cable retention (IEC 61300-2-4)
EN 61300-2-9	Shock ((IEC 61300-2-9)
EN 61300-2-12:2009	Part 2-12: Tests – Impact (IEC 61300-2-12:2009)
EN 61300-2-22	Part 2-22: Tests – Change of temperature (IEC 61300-2-22)
EN 61300-2-26	Part 2-26: Tests – Salt mist(IEC 61300-2-26)
EN 61300-2-33	Part 2-33: Tests – Assembly and disassembly of fibre optic closures(IEC 61300-2-33)
EN 61300-2-34	Part 2-34: Tests – Resistance to solvents and contaminating fluids (IEC 61300-2-34)
EN 61300-3-1	Part 3-1: Examinations and measurements – Visual examination (IEC 61300-3-1)
EN 61300-3-3:2009	Part 3-3: Examinations and measurements – Active monitoring of changes in attenuation and return loss
EN 61300-3-28	Part 3-28: Examinations and measurements – Transient loss (IEC 61300-3-28)
EN 61753-1	Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standard (IEC 61753-1)
EN 61756-1	Fibre optic interconnecting devices and passive components - Interface Standard for Fibre management systems - Part 1: General and guidance (IEC 61756-1)

EN 61758-1	Fibre optic interconnecting devices and passive components - Interface Standard for closures - Part 1: General and Guidance (IEC 61758-1)
ITU-T G.657	Characteristics of a bending loss insensitive single mode optical fibre and cable for the access network

142

143 3 Definitions and abbreviations

144 3.1 Definitions

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

146

147 3.1.1

148 **fibre splicing management system**

149 a system to control fibre routing from the incoming to the out going fibres, containing one or more splice
 150 cassettes and additional functional elements. It provides a means for routing, storing and protecting of fibre
 151 splices or other passive optical devices in a predetermined order, from one cable sheath opening to another.
 152 Fibre circuits may be separated to an appropriate separation level, SC, SR, SE, ME and MR. This will limit the
 153 risk of interruption of traffic to those fibres that belong to the same of circuits

154 3.1.2

155 **air blown fibre**

156 provides for pressurised air to propel, fibres, fibre units and microduct optical fibre cables through a microduct
 157 tube system

158 3.1.3

159 **microduct connector system**

160 provides for routing blown fibres or microduct fibre units, between hollow conduits (microducts), and
 161 interconnects the microducts by use of pneumatic connectors, tube welding, crimp connectors or push on
 162 connectors. The microduct connection method is both air and water tight. It is organised into accessible rows
 163 within the closure

164 3.1.4

165 **single circuit**

166 a fibre management system is a group of fibres providing 1 termination or service on 1 or 2 fibres. In this
 167 document a single circuit is considered to be a circuit of 2 fibres or a 4 fibre ribbon circuit

168 3.1.5

169 **single element**

170 a fibre management system is a cable subassembly. It comprises one or more optical fibres inside a common
 171 covering e.g. tube, or inside one groove of a grooved cable (slotted core cable). Single elements provide more
 172 than one termination or circuit of typically 12 fibres. In this document a single element is considered to be a
 173 group of 12 fibres

174 **3.1.6**175 **single ribbon**

176 a fibre management system is a cable subassembly. It comprises one optical ribbon. Single ribbon is a group of
177 fibres providing one termination or service of typically 4, 8 or 12 fibres

178 **3.1.7**179 **multiple elements**

180 a fibre management system provides all necessary equipment to connect a defined number of incoming and
181 outgoing fibres/cables. It comprises storage and protection of fibres and interconnections in one splice tray for
182 more than one single element. Typically splice tray capacities are between 24 and 144 fibres

183 **3.1.8**184 **multiple ribbons**

185 a fibre management system provides all necessary equipment to connect a defined number of incoming and
186 outgoing fibre ribbons that are generally housed within a single tube within the cable. This tube is fixed to the
187 entry and exit ports of the splice tray. It comprises storage and protection of more than one single ribbon, but
188 typically six or more fibre ribbons and their interconnections in a single splice tray for ribbons between 4 and 36
189 fibres, but typically 12 fibre ribbons. There are also many different names for this structure, e.g. mass storage or
190 mass ribbons. Typically splice tray capacities are between 36 and 144 fibres

191 **3.1.9**192 **single circuit fibre management system**

193 a fibre system separation level, that is down to the individual customer level achieving the minimum of customer
194 circuit disturbance

195 **3.1.10**196 **positive fibre management system**

197 fibre systems capable of controlling the fibre minimum bend radius throughout the network

198

199 **3.1.1**200 **future proof fibre management system**

201 a fibre management system is capable of change, or expansion in the future, covering all FMS (SC, SE, SR, ME,
202 MR) by modular adaptation

203 **3.1.12**204 **future proof enclosures**

205 they should be capable to be able to change or expand in the future, without disturbing existing cables and fibre
206 systems

207

208 **3.1.13**209 **cable element**

210 a cable element is a grouping of fibres under the cable sheath.

211

212 **3.2 Abbreviations**

213

214	PS	Product Specification
215	MD	Microduct
216	ABF	Air Blown Fibre
217	OD	Outside Diameter
218	ID	Inside Diameter
219	FMS	Fibre Management System

220

221

222 4 Description

223 4.1 Optical fibre wall box housing

224 An optical fibre wall box comprises a housing that is attached to the ends of the joined cable sheaths, and a
225 means for containing and protecting the fibres, splices, and other passive optical devices.

226
227 This also includes wall boxes used for blowing cable or fibre. This comprises an access housing that allows the
228 interconnection of cable ducts or tubes and is attached to the ends of the ducts or cables containing empty
229 tubes.

230
231 The fibre management wall box provides facilities for the environmental protection, housing for fibre
232 management systems and sealing of input and output optical cables. In order to comply with the standard, the
233 optical functionality, physical, geometrical and mechanical requirements are defined.

234
235 The following table illustrates the concept of a single wall box design/size being able to accommodate various
236 fibre separation levels in a splice wall box for SC and SE.

237

238

Table 1

prEN 50411-3-1				
Compatible tray/box envelope (size)	Number Splices (SC)	Number trays SC (2 fibres/tray)	Number splices (SE)	Number trays SE (12 fibres/tray)
A and F	8	4	24	2
A and H	24	12	72	6
C and K	48	24	144	12
D and N	96	48	288	24

239

240

241 The design of the wall box housing shall allow the jointing of two or more cable ends in the following
242 configurations or applications:

243

244 Common wall boxes covering:

245

246 **(T) Track wall box** configuration used on customer feed cable with a minimum of 2 cable entries specified for
247 each wall box size in the tables, typical when joining two cables along a track.

248

249 **(S) Spur wall box** configuration used on local feeder cable with minimum of 3 cable entries, typically a cable drop
250 off point to along a track feeder cable.

251

252 **(D) Distribution wall box** configuration used on a local feeder cable with a minimum of 6 cable entries to distribute
253 smaller cables to different locations.

254

255 NOTE Cable entries can be more than one cable per cable entry port.

256

257 The design of the wall box housing shall allow the joining together of at least one pair of cables which are not at
258 the end of a cable section, without cutting all fibres between both cable openings. This application is generally
259 known as distribution joint or external node, but also called a mid-span or balloon splice wall box.

260

261 It is desirable that the wall box can be re-opened when necessary without interruption or disturbance of the
262 traffic of the live circuits.

263