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Delilniki za optiļ na vlakna in kabelske spojnice za optiļ ne komunikacijske sisteme - Specifikacije izdelka - 3-2. del: Enorodna mehanska optiļ na spojnica

Fibre organisers and closures to be used in optical fibre communication systems - Product specifications - Part 3-2: Singlemode mechanical fibre splice

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ICS

English version

Fibre organisers and closures to be used in optical fibre communication systems - Product specifications - Part 3-2: Singlemode mechanical fibre splice

To be completed

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This draft European Standard is submitted to CENELEC members for CENELEC enquiry.
Deadline for CENELEC: 2009-06-12.

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

Central Secretariat: avenue Marnix 17, B - 1000 Brussels

Project: 21887

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1 # 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.

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Fibre organisers and closures to be used in optical fibre communication systems – Product specifications

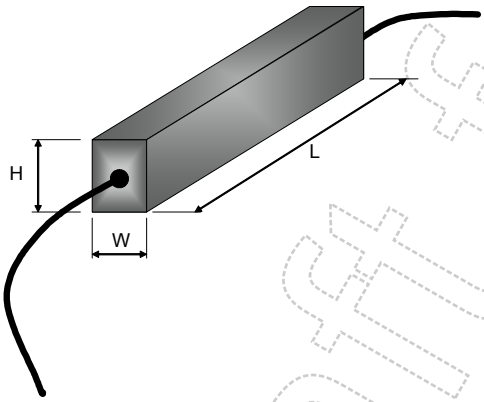
Part 3-2: Singlemode mechanical fibre splice

Description		Performance	
Type:	Fibre splice	Application:	EN 61753-1:2007, Category U with extension of lower temperature to -40 °C
Style:	Mechanical		
Operating wavelength:	1 260 nm to 1 625 nm	Attenuation grades	Grade B: ≤ 0,25 dB maximum (97 %) ≤ 0,12 dB average (50 %) Grade C: ≤ 0,50 dB maximum (97 %) ≤ 0,25 dB average (50 %)
Fibre category	EN 60793-2-50 type B1.1	Return loss grades	Grade 1: ≥ 60 dB Grade 2: ≥ 45 dB Grade 3: ≥ 35 dB

Related documents:

EN 60793-2-50	Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres
EN 60794-2-50	Optical fibre cables – Part 2-50: Indoor cables – Family specification for simplex and duplex cables for use in terminated cable assemblies
EN 61300 series	Fibre optic interconnecting devices and passive components – Basic test and measurement procedures
EN 61753-1:2007	Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards

Outline and maximum dimensions:



Variant	Dimension W mm	Dimension H mm	Dimension L mm
Type M1	3,8	6,4	38
Type M2	4,0	4,0	36
Type M3	3,2	3,2	46
Type M4	4,2	4,2	44
Type M5	4,0	4,0	40
Type M6	Ø 5,0		65

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1 Scope

1.1 Product definition

This standard contains the initial, start of life dimensional, optical, mechanical and environmental performance requirements, which a singlemode mechanical splice must meet in order for it to be categorised as an EN standard product.

Since different variants and grades of performance are permitted, product marking and identification details are given in 3.5.

Although in this document the product is qualified for EN 60793-2-50 type B1.1 singlemode fibre it may also be suitable for other fibre types.

1.2 Interoperability

The installed mechanical splice fits into a fibre management system with optical fibre splice cassettes or splice trays. This standard specifies the following two physical interface dimensions:

- cross sectional profile with width, height or diameter (in millimetres);
- length (in millimetres).

1.3 Expected performance

In this document, the performance of a mechanical splice is given with identical fibres only. Losses associated with fibre cladding diameter and mode field mismatch are not taken into account. The measured attenuation is a function of the core concentricity, cladding non-circularity and alignment capability. The optical return loss performance is a function of the index matching gel and the fibre end face preparation.

1.4 Operating environment

The tests selected combined with the severities and durations are representative of an outdoor enclosed environment defined as category U in EN 61753-1. To ensure that the product can be used in closures, boxes or street cabinet for categories A, G and S (as defined EN 61753-1) the specified lower temperature is extended to -40 °C and requirements for temporary flooding have been added.

1.5 Reliability

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

1.6 Quality assurance

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

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.

EN 60793-2-50	Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres
EN 61753-1:2007	Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards
EN 61300 series	Fibre optic interconnecting devices and passive components – Basic test and measurement procedures
EN 61300-2-1	Part 2-1: Tests – Vibration (sinusoidal)
EN 61300-2-4	Part 2-4: Tests – Fibre/cable retention
EN 61300-2-5	Part 2-5: Tests – Torsion/twist
EN 61300-2-7	Part 2-7: Tests – Bending moment
EN 61300-2-9	Part 2-9: Tests – Shock
EN 61300-2-17	Part 2-18: Tests – Cold
EN 61300-2-18	Part 2-18: Tests – Dry heat – High temperature endurance
EN 61300-2-22	Part 2-22: Tests – Change of temperature
EN 61300-2-26	Part 2-26: Tests – Salt mist
EN 61300-2-27	Part 2-27: Tests – Dust – Laminar flow
EN 61300-2-33	Part 2-33: Tests – Assembly and disassembly of closures
EN 61300-2-45	Part 2-45: Tests – Durability test by water immersion
EN 61300-2-46	Part 2-46: Tests – Damp heat cyclic
EN 61300-3-3:2003	Part 3-3: Examinations and measurements – Active monitoring of changes in attenuation and return loss
EN 61300-3-4:2001	Part 3-4: Examinations and measurements – Attenuation
EN 61300-3-6:2007	Part 3-6: Examinations and measurements – Return loss
EN 61300-3-7:2001	Part 3-7: Examinations and measurements – Wavelength dependence of attenuation and return loss
EN 61300-3-28:2002	Part 3-28: Examinations and measurements – Transient loss

3 Description

A single mode mechanical fibre splice is a passive optical interconnection component, which provides optical and mechanical continuity between 2 optical fibres or cables. The products described in this specification are based on mechanical alignment of 2 cleaved fibres. The fibres are protected against ingress of dust or water by a sealing material, generally an index matching gel, to both minimise reflections and to improve attenuation at the glass/gel/glass interface.

Some splices may have a limited reinstallation capability. In this case the re-installability shall be clearly stated and the re-installation test 10 in 8.3 shall be conducted.

3.1 Mechanical splice

An optical fibre mechanical splice body contains the following pre-assembled elements:

- an alignment device;
- a sealing and index matching gel inside;
- a fibre alignment activation device like a spring, wedge or plunger;
- a fibre clamping or fixing able to withstand axial fibre loads.

Mechanical splices designed for use with cables shall contain strain relief fixing.

3.2 Materials

Materials which are not specified or which are not specifically described are left to the discretion of the manufacturer. However, the following requirements shall be met.

- All materials that are likely to come in contact with personnel shall meet appropriate health and safety regulations.
- The sealing and index matching materials shall be compatible with the materials of the fibres and the mechanical splice parts.
- All components of the splice shall be resistant to solvents and degreasing agents that are typically used to clean and degrease fibres and cables.
- Metallic parts shall be resistant to the corrosive influences they may encounter during the lifetime of the product.
- Exterior polymer materials shall be resistant to mould growth.

3.3 Dimensions

Outline dimensions are specified. All other dimensions are left to the discretion of the manufacturer.

3.4 Colour and marking

Marking of the product or packaging shall be in the following order of precedence:

a) identification of manufacturer;

b) manufacturing date code: year/week;

c) manufacturers part number;

d) variant identification number.

There is no preferred colour specified.

116 # 4 Variants

117 **Table 1 – Optical fibre mechanical splice, for category U – variants**

118 **EN 50411–3–2 – XX_1 – X_2 – X_3 – X_4 – X_5**

Variant No. XX_1	Mechanical splice type (common profile)
M1	Mechanical splice Type 1
M2	Mechanical splice Type 2
M3	Mechanical splice Type 3
M4	Mechanical splice Type 4
M5	Mechanical splice Type 5
M6	Mechanical cable splice Type 6

Variant No. X_2	Attenuation grade
B	≤ 0,12 dB average ≤ 0,25 dB maximum
C	≤ 0,25 dB average ≤ 0,50 dB maximum

Variant No. X_3	Return loss grade capability (depends on cleave/process)
1	≥ 60 dB
2	≥ 45 dB
3	≥ 35 dB

Variant No. X_4 and X_5	Fibre types to be spliced
P	Primary coated 125/250 µm
S	Secondary coated 125/900 µm
A	Any single fibre types **P** or **S**
R	Reinforced cable

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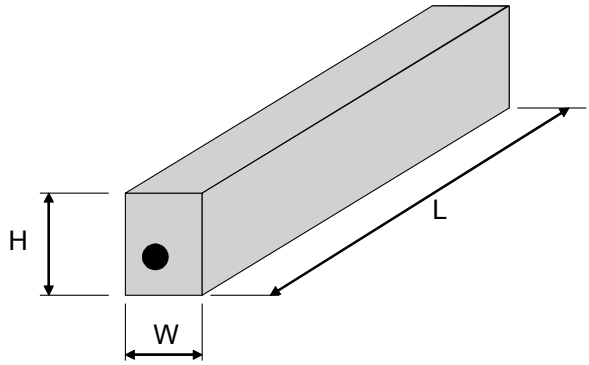
5 Dimensional requirements



Variant	Description	Dimension W ± 0,1 mm mm	Dimension H ± 0,1 mm mm	Dimension L ± 1 mm mm
Type M1	Mechanical Type M1	3,8	6,4	38
Type M2	Mechanical Type M2	4,0	4,0	36
Type M3	Mechanical Type M3	3,2	3,2	46
Type M4	Mechanical Type M4	4,2	4,2	44
Type M5	Mechanical Type M5	4,0	4,0	40
Type M6	Mechanical Type M6	Ø 5,0		65

Figure 1 – Outline and maximum dimensions

6 Tests

6.1 Introduction

The mechanical and environmental performance of a fibre splice is vital to an optical cabling system. The purpose of testing is to demonstrate that a mechanical splice remains functional under defined environmental conditions, without failures.

Optical performance testing is accomplished by subjecting the test specimen to a number of mechanical and environmental conditions and by measuring any optical performance deviations at prescribed intervals during and after completion of each test.

6.2 Test sample preparation

The test samples are prepared by making a mechanical splice on identical fibres. Optical test samples shall be installed according to the manufacturers' installation instructions. The fibres for the optical test samples are single mode fibres as described in Annex A. The length of the fibres shall be at least 2 m on each side of the mechanical splice. For each fibre construction (primary coated, secondary coated or reinforced cable) a number of test samples will be prepared as defined in Table B.1.

6.3 Test and measurement methods

All tests and measurement methods have been selected from EN 61300 series.

Unless otherwise stated in the individual test details, all attenuation measurements shall be performed at 1 310 nm ± 25 nm, 1 550 nm ± 25 nm and 1 625 nm ± 25 nm. All specified optical losses are referenced to the initial attenuation at the start of the test.