Fibre management systems and protective housings to be used in optical fibre communication systems - Product specifications - Part 3-6: Multi- mode mechanical fibre splice

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 50411-3-6:2022 sisaldab Euroopa standardi EN 50411-3-6:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 50411-3-6:2022 consists of the English text of the European standard EN 50411-3-6:2022.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 29.04.2022.	Date of Availability of the European standard is 29.04.2022.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Fibre management systems and protective housings to be used in optical fibre communication systems - Product specifications - Part 3-6: Multi- mode mechanical fibre splice

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 3-6: Epissure mécanique de fibres multimodales

LWL-Spleißkassetten und -Muffen für die Anwendung in LWL Kommunikationssystemen - Produktnorm - Teil 3-6: Mechanische Spleiße von Mehrmoden-Faser für geschützte Freiluftanwendungen (Kategorie U)

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

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European foreword

This document (EN 50411-3-6:2022) has been prepared by CLC/TC 86BXA “Fibre optic interconnect, passive and connectorised components”.

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2023-03-14
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2023-03-14

This document supersedes EN 50411-3-6:2013 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

EN 50411-3-6:2022 includes the following significant technical changes with respect to EN 50411-3-6:2013:

— terms and definitions are added;

— the EN 61753-1:2007 category U tests and test severities are replaced by the EN IEC 61753-1:2018 category OP test and test severities;

— the references are updated.

Any feedback and questions on this document should be directed to the users’ national committee. A complete listing of these bodies can be found on the CENELEC website.

Introduction

Fibre management systems and protective housings to be used in optical fibre communication systems - Product specifications

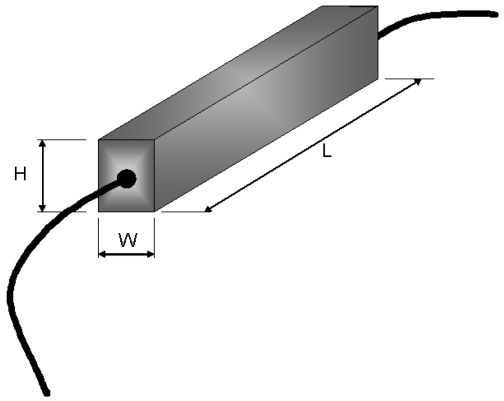
Part 3–6: Multimode mechanical fibre splice

Description		Performance	
Type:	Fibre splice	Application:	EN IEC 61753-1, Category OP
Style:	Mechanical		with extension of lower temperature to −40 °C
Operating wavelengths:	850 nm and/or 1 300 nm	Attenuation grades:	Grade A_m:
			≤ 0,25 dB max. for ≥ 97 % of connections
			≤ 0,12 dB average
			Grade B_m:
			≤ 0,6 dB max. for ≥ 97 % of connections
			≤ 0,3 dB average
			Grade C_m:
			≤ 1,0 dB max. for ≥ 97 % of connections
			≤ 0,5 dB average
Fibre category:	EN IEC 60793-2-10 types A1-OM1, A1-OM2, A1-OM3, A1-OM4 and A1-OM5	Return loss grades:	Grade 2_m: ≥ 20 dB

Related documents:

EN IEC 60793-2-10	Optical fibres – Part 2–10: Product specifications - Sectional specification for category A1 multimode fibres (IEC 60793-2-10)
EN 60794-2-50:2008	Optical fibre cables – Part 2–50: Indoor cables – Family specification for simplex and duplex cables for use in terminated cable assemblies (IEC 60794-2-50:2008)
EN 61300 series	Fibre optic interconnecting devices and passive components – Basic test and measurement procedures (IEC 61300 series)
EN IEC 61753-1	Fibre optic interconnecting devices and passive components – Performance standard – Part 1: General and guidance (IEC 61753-1)

Outline and nominal 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

1 Scope

1.1 Product definition

This document contains the initial, start of life dimensional, optical, mechanical and environmental performance requirements, which multimode mechanical splice needs to meet in order for it to be categorized as a European standard product.

Although, in this document, the product is qualified for EN IEC 60793-2-10 types A1-OM1, A1-OM2, A1-OM3, A1-OM4 and A1-OM5 multimode fibres, it can also be suitable for other fibre types with 125 µm cladding diameter.

1.2 Interoperability

The installed mechanical splice fits into optical fibre management system with optical splice cassettes or splice trays as defined in EN IEC 61756-1. This document 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 the mechanical splice is given with identical fibres only as specified in Annex A. Losses associated with tolerances in fibre cladding diameter and core diameter 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 category OP as defined in EN IEC 61753-1:2018, Table A.5. To ensure that the product can be used in outdoor closures, boxes or street cabinets for categories A, G or S (as defined in EN IEC 61753-1:2018, Tables A.13, A.14 and A.15) the specified lower temperature is extended to −40 °C and a water immersion requirement for temporary flooding conditions has been added.

1.5 Reliability

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

1.6 Quality assurance

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

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 IEC 60793-2-10, *Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres(IEC 60793-2-10)*

EN 61300-1, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance (IEC 61300 1)*

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

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

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

EN 61300-2-7, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-7: Tests - Bending moment (IEC 61300 2 7)*

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

EN 61300-2-17, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-17: Tests - Cold (IEC 61300 2 17)*

EN 61300-2-18, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-18: Tests - Dry heat - High temperature endurance (IEC 61300 2 18)*

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

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

EN 61300-2-27, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-27: Tests - Dust - Laminar flow (IEC 61300 2 27)*

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

EN 61300-2-45, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-45: Tests - Durability test by water immersion (IEC 61300 2 45)*

EN IEC 61300-2-46, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-46: Tests - Damp heat, cyclic (IEC 61300 2 46)*

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

EN 61300-3-4, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-4: Examinations and measurements - Attenuation (IEC 61300 3 4)*

EN 61300-3-6, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-6: Examinations and measurements - Return loss (IEC 61300 3 6)*

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

3 Terms and definitions

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

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

— IEC Electropedia: available at https://www.electropedia.org/

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

3.1
fibre splice
permanent or separable joint the purpose of which is to couple optical power between two optical fibres, achieved by either a fusion or a mechanical technique

[SOURCE: IEV 731-05-05 modified]

4 Description

4.1 General

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

Some splices could have a limited reinstallation capability. In this case the re-installability shall be clearly stated and the re-installation test 7 of Table 4 in 9.4 shall be conducted.

4.2 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.