SLOVENSKI STANDARD
SIST EN 50411-2-10:2015

01-julij-2015

Delilniki za optična vlakna in kabelske spojnice za optične komunikacijske sisteme - Specifikacije izdelka - 2-10. del: Zatesnjena ohišja optičnih spojnic tipa 2, kategorija G, za optična razdelilna omrežja FTTH

Fibre organisers and closures to be used in optical fibre communication systems - Product specifications - Part 2-10: Sealed fibre splice closures type 2, category G, for FTTH optical distribution networks

LWL-Spleißkassetten und -Muffen für die Anwendung in LWL-Kommunikationssystemen – Produktnormen -- Teil 2-10: LWL-Muffen Typ 2 die Kategorie G

Organiseurs et boîtiers de fibres à utiliser dans les systèmes de communication par fibres optiques - Spécifications de produits -- Partie 2-10: Boîtiers à épissure de fibres scellés Type 2, catégorie G, pour réseaux de distribution optiques FttH

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ICS:

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices

SIST EN 50411-2-10:2015 **en**

EUROPEAN STANDARD

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EN 50411-2-10

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English Version

Fibre organisers and closures to be used in optical fibre communication systems - Product specifications - Part 2-10: Sealed fibre splice closures type 2, category G, for FTTH optical distribution networks

Organiseurs et boîtiers de fibres à utiliser dans les systèmes de communication par fibres optiques - Spécifications de produits - Partie 2-10: Boîtiers à épissure de fibres scellés Type 2, catégorie G, pour réseaux de distribution optiques FttH

LWL-Spleißkassetten und -Muffen für die Anwendung in LWL-Kommunikationssystemen - Produktnormen - Teil 2-10: Abgedichtete LWL-Muffen Typ 2 für die Kategorie G für optische FTTH-Verteilnetze

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 50411-2-10:2015) 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)	2015-11-11
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2017-11-11

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

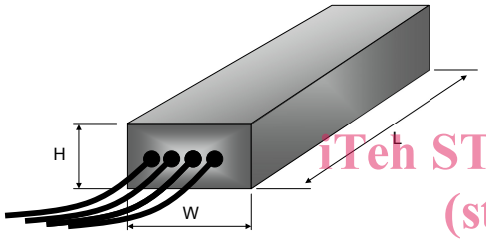
Part 2-10: Sealed fibre splice closures type 2, category G, for FTTH optical distribution networks

Description		Performance	
Construction:	Sealed closures IP67	**Applications**:	
Fibre management:	Single Circuit, Single Element, Multiple Element and/or Single/Multiple Ribbon	Optical fibre cable networks for ground level	EN 61753-1, category G

Related documents:

EN 60793-2-50	Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres (IEC 60793-2-50)
EN 60794-2	Optical fibre cables – Part 2: Indoor cables – Sectional specification (IEC 60794-2)
EN 60794-3	Optical fibre cables – Part 3: Sectional specification – Outdoor cables (IEC 60794-3)
EN 61753-1	Fibre optic interconnecting devices and passive components – Part 1: General and guidance for performance standard (IEC 61753-1)
EN 61300 series	Fibre optic interconnecting devices and passive components – Basic test and measurement procedures (IEC 61300 series)

Construction and splice capacity:



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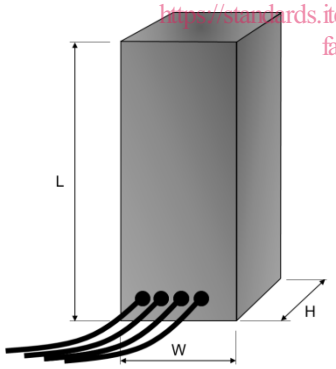
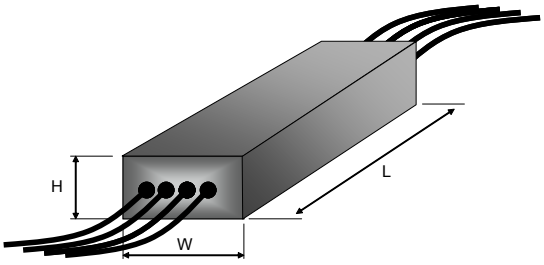


Pan type



In-line type

Closure size and minimum total splice capacity

	Fibre management system separation level				
Closure size	**Single Circuit (SC)**	**Single Element (SE)**	**Single Ribbon (SR)**	**Multiple Element (ME)**	**Multiple Ribbon (MR)**
R	4	12	-	-	-
A	8	12	-	24	-
B	16	24	12	48	24
C	32	48	24	96	48
D	48	72	48	144	96
E	96	144	96	288	192
F	144	216	144	432	288
G	192	288	192	576	384
H	288	432	288	864	576

1 Scope

1.1 Product definition

This specification contains the dimensional, optical, mechanical and environmental performance requirements of a fully installed splice closure for use in optical distribution networks at ground level (category G) in order for it to be categorised as an EN standard product. This type of sealed closure is intended for easy and/or frequent opening and closing in FTTH distribution and drop cable networks.

NOTE The sealing performance requirements and test severities of these closures are selected to obtain an IP 67 intrusion protection performance as defined in EN 60529.

1.2 Operating environment

The tests selected combined with the severity and duration are representative of an outside plant for ground level environment defined by EN 61753-1, category G: ground level. This corresponds with:

- operating temperature range: -40 °C to +65 °C;
- direct exposure to non weather protected outside plant conditions;
- deployment at ground level up to 3 metres above ground level;
- additionally to the category G environment, a deployment till 1 metre below ground level is added. Direct buried applications are allowed, however additional protection will be required when the locations are intended for passage of cars or other heavy vehicles.

1.3 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.

1.4 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.

1.5 Allowed fibre and cable types

Although the performance tests are carried out on test samples containing dispersion unshifted single mode fibre (see Annex A), the closure, once tested according to this product specification, will be also suited for other fibre types like dispersion shifted, non-zero dispersion shifted and multimode fibres.

This closure standard allows both single mode and multimode fibre to be used and covers IEC standard optical fibre cables with their various fibre capacities, types and designs. This includes, but is not limited to, optical fibre cable standards EN 60794-2 (indoor), EN 60794-3 (outdoor).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 (IEC 60793-2-50)
EN 60794-2	Optical fibre cables – Part 2: Indoor cables – Sectional specification (IEC 60794-2)
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 61300-2-5	Part 2-5: Tests – Torsion (IEC 61300-2-5)

EN 61300-2-10	Part 2-10: Test – Crush resistance (IEC 61300-2-10)
EN 61300-2-12	Part 2-12: Tests – Impact (IEC 61300-2-12)
EN 61300-2-22	Part 2-22: Tests – Change of temperature (IEC 61300-2-22)
EN 61300-2-23	Part 2-23: Tests – Sealing for non-pressurised closures of fibre optic devices (IEC 61300-2-23)
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 mechanical splices, fibre management systems and closures (IEC 61300-2-33)
EN 61300-2-34	Part 2-34: Tests – Resistance to solvents and contaminating fluids of interconnecting components and closures (IEC 61300-2-34)
EN 61300-2-37	Part 2-37: Tests – Cable bending for fibre optic closures (IEC 61300-2-37)
EN 61300-2-38	Part 2-38: Tests – Sealing for pressurized fibre optic closures (IEC 61300-2-38)
EN 61300-3-1	Part 3-1: Examinations and measurements – Visual examination (IEC 61300-3-1)
EN 61300-3-3	Part 3-3: Examinations and measurements – Active monitoring of changes in attenuation and return loss (IEC 61300-3-3)
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 standards (IEC 61753-1)

3 Description

3.1 Fibre splice closure

A fibre splice closure comprises a housing providing a mean to attach the ends of the incoming and outcoming cables and a means for containing and protecting the fibres, splices and other passive optical devices.

This is not to be confused with an optical closure for blowing cable or fibre. This comprises an access housing that allows the interconnection of cable ducts or tubes and is attached to the ends of the ducts or cables containing empty tubes. However, EN 50411-2-10 shall be used when air blown fibres are spliced inside this type of closure.

The closure provides facilities for environmental protection, housing for a fibre management system and sealing of input and output optical fibre cables. In order to comply with the standard, the optical functionality, geometrical, environmental and mechanical requirements are defined.

The design of the closure housing shall allow the jointing of two or more cable ends in the following configurations or applications:

(T) Track joint configuration used to interconnect at least two cables (example: drop cable repair closure)

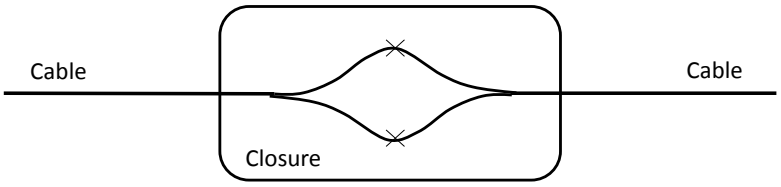


Figure 1

(S) Spur joint configuration used to split one cable into at least 2 smaller cables.

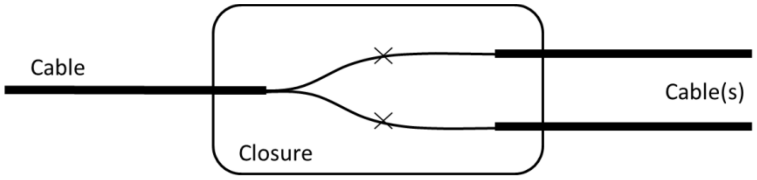


Figure 2

(D) Distribution joint configuration used on customer feed cable with minimum of 8 cable entries (D1), 10 cable entries (D2), 18 cable entries (D3) or 34 cable entries (D4) (see Clause 4).

Figure 3

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

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

It is desirable that the distribution closure can be re-opened when necessary without interruption or disturbance of the traffic of the live circuits.

3.2 Closure overpressure safety

Overpressure can build up in sealed closures due to temperature differentials, or due to atmospheric pressure changes over a period of time, or due to flash testing of the seals after installation, or due to incorrect installation techniques. Care should be taken when opening a sealed closure.

Provisions shall be made that overpressure is exhausted when opening the closure prior to complete removal of the cover.

For air blown fibre applications an overpressure release system is required for all sealed closures.

3.3 Cable and closure seals

The closure allows for a physical housing structure that provides optical cable fixing, sealing, anchoring, water and gas blocking, storage and routing up to the input and output fibres of the fibre management system.

3.4 Fibre management system

The fibre management system in the closure provides means for routing, storing and mechanical protection of fibre splices or other passive optical devices in a predetermined order, from one cable sheath opening to another.

Fibre circuits may be separated to an appropriate separation level. This will limit the risk of interruption of traffic to those fibres that belong to the same group of circuits when changes are made to other circuits.

- **Single Circuit (SC)** is a fibre management separation level containing a group of fibres providing one termination or service on 1, 2 or 4 fibres to one subscriber. In this document a Single Circuit is considered to be a circuit of 4 fibres.
- **Single Element (SE)** is a fibre management separation level containing one or more optical fibres from a cable element inside a common covering e.g. loose tube or inside one groove of a grooved cable (slotted core cable). Single Elements provide terminations or services to more than one subscriber and contain typically 12 fibres. In this document a Single Element is considered to be a group of 12 fibres.
- **Single Ribbon (SR)** is a fibre management separation level comprising one optical ribbon. Single Ribbon is a group of fibres providing one termination or service to one subscriber with of typically 4, 8 or 12 fibres per ribbon. In this document ribbon is considered to have 12 fibres.
- **Multiple Element (ME)** is a fibre management separation level that provides all necessary equipment to connect a defined number of incoming and outgoing fibres/cables. It comprises storage and protection of fibres and interconnections in one splice tray for more than one Single Element circuit. Typically ME splice tray capacities are 24, 72 and 144 fibres. In this document a Multiple Element is considered to have 24 fibres.
- **Multiple Ribbon (MR)** fibre management separation level provides all necessary equipment to connect a defined number of incoming and outgoing fibre ribbons that are generally housed within a singe tube or slot within the cable. It comprises storage and protection of more than one Single Ribbon circuit, with typically six or more fibre ribbons and their interconnections in a single splice tray for ribbons between 4 and 36 fibres per ribbon (typically 12 fibres per ribbon). There are also many different names for this structure, e.g. mass splicing storage or mass ribbons. The splice tray capacities are between 24 and 144 fibres. In this document a Multiple Ribbon is considered to have 2 ribbons of 12 fibres (=24 fibres in total)

3.5 Materials

All materials that are likely to come in contact with personnel shall meet appropriate health and safety regulations.

Closure and sealing materials shall be compatible with each other and with the materials of the cables.

All components of the closure shall be resistant to solvents and degreasing agents that are typically used to clean and degrease fibres and cables.

The effects of UV light and fungi on all exposed polymeric materials shall not affect product performance. The effects of fungus and UV light shall be determined by measuring the decrease of a suitable property (e.g. tensile strength) both before and after exposure.

Metallic parts shall be resistant to the corrosive influences they may encounter during the lifetime of the product.

3.6 Colour and marking

Marking/identification of the ‘variant number’ (see Clause 4) to be on the product or packaging label along with the following:

a) identification of supplier or manufacturer;

b) manufacturing date code: year / month.

There is no preferred colour for the outer closure materials.