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BSI Standards Publication

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

Part 4-1: Passive optical street cabinet for category A

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National foreword

This British Standard is the UK implementation of EN 50411-4-1:2019.

The UK participation in its preparation was entrusted to Technical Committee GEL/86/2, Fibre optic interconnecting devices and passive components.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Fibre management systems and protective housings to be used in optical fibre communication systems - Product specifications - Part 4-1: Passive optical street cabinet for category A

Organiseurs et boîtiers de fibres à utiliser dans les systèmes de communication par fibres optiques - Spécifications de produits - Partie 4-1

LWL-Spleißkassetten und -Muffen für die Anwendung in LWL-Kommunikationssystemen - Produktnormen - Teil 4-1

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European foreword

This document (EN 50411-4-1:2019) 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)	2020-05-20
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2022-05-20

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Part 4-1: Passive optical street cabinet for category A

Description	Typical installation configuration	Typical mounting options
Street Cabinet	Outdoor Fibre Distribution Cabinet	On the ground

Typical fibre management configurations

- Direct spliced fibres with and without branching devices
- Interconnect with and without branching devices
- Cross-connect with and without branching devices

Operating service environments

Applications: Optical fibre cable networks For outdoor above ground (aerial) applications	EN 61753-1 category A

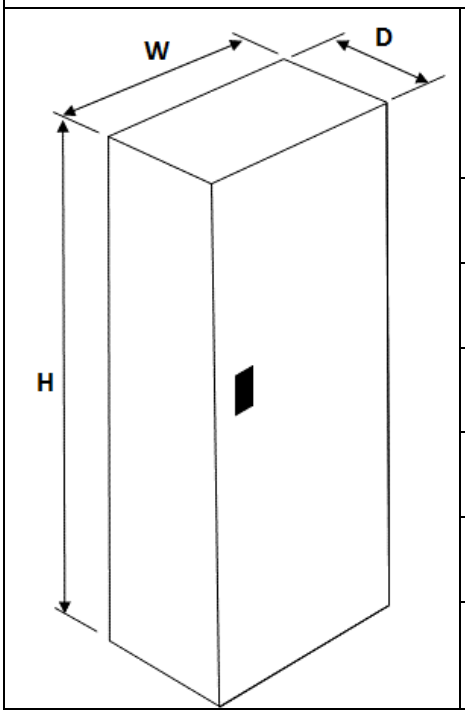
Modular adapter plates for the following connectors

Connector type	Adapter size	Standard
SC	Simplex or duplex	EN 61754-4
LC	Simplex or duplex	EN 61754-20
LSH	Simplex or Duplex	EN 61754-15
LF3	Simplex or Duplex	EN 61754-28
MPO	Simplex	EN 61754-7

Fibre separation levels in Fibre Management System

Single circuit (1, 2 or 4 fibre splices per tray), Single element (6, 8 or 12 fibre splices per tray), Multiple element (up to 144 fibre splices per tray)	Single ribbon (1 ribbon splice per tray), Multiple ribbon (12 ribbon splices per tray)

Street cabinet sizes and dimensions



Size	Maximum fibre splice capacity	Maximum connections (adapters) capacity	Maximum outline dimensions (mm)		
			W	H	D
A	288	216	500	1 000	400
B	576	432	800	1 000	400
C	768	576	1 300	1 200	400
D	1 024	768	1 300	1 500	400
E	1 296	972	1 900	1 500	400
F	1 728	1 296	1 900	1 800	400

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1 Scope

1.1 Product definition

This document covers passive optical fibre street cabinets for use in outside plant environments under category A according to EN 61753-1.

This document contains the dimensional, optical, mechanical and environmental performance requirements of an installed passive optical fibre street cabinet, in order for it to be categorised as an European standard product.

The street cabinet is a protective housing containing a modular fibre management system with splice trays for various fibre separation levels and connector mounting plates. The street cabinet may contain one or more of the following:

– storage and routing of fibre and cable;

– uncut (looped) fibre and cable storage;

– splice trays;

– adapters and connectors;

– passive optical components (optical power splitters and wavelength division multiplexers).

Street cabinets can also contain active optical components (amplifiers, converters, power supplies), but these applications are not part of this document.

1.2 Operating environment

The tests selected, combined with the severity and duration, are representative of outside plant above ground environments defined by EN 61753-1 Category A: Aerial environment.

1.3 Reliability

Whilst the anticipated service life expectancy of the product in this environment is 20 years, compliance with this document 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 document 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

This street cabinet standard allows EN 60793-2-50 single-mode fibres and EN 60793-2-10 A1-OM1 to A1-OM5 multimode fibres to be used and is suitable for all EN 60794 series optical fibre cables with their various fibre capacities, types and designs as long as fitting in the cabinet does not contravene the minimum bend radius.

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

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

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

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

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

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 61300-2-33, *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 61300-2-34, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-34: Tests - Resistance to solvents and contaminating fluids of interconnecting components and closures (IEC 61300-2-34)*

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

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

EN 61753-1, *Fibre optic interconnecting devices and passive components performance standard - Part 1: General and guidance for performance standards (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)*

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3 Terms, definitions and abbreviations

3.1 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 http://www.electropedia.org/

• ISO Online browsing platform: available at http://www.iso.org/obp.

3.1.1
active fibre or live fibre
fibre in an optical circuit or node that is carrying an optical signal

3.1.2
adapter
component in which two or more ferrules are aligned

Note 1 to entry: A ferrule is the fibre holding component part of the optical fibre connector plug.

3.1.3
cable element
grouping of fibres under the cable sheath

3.1.4
fan-out
passive optical component providing a transition between a single ribbon or single element and individual fibres

3.1.5
fibre management system
FMS
system to control, protect and store splices, connectors, passive optical components and fibres from incoming to outgoing cables

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

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

3.1.6
free breathing housing
protective housing that allows a free exchange of air with the environment

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

Note 2 to entry: A free breathing closure may look like a sealed closure, but it is not designed to hold a varying overpressure or underpressure caused by temperature changes or atmospheric pressure changes.

3.1.7
microduct
small, flexible lightweight tube with an outer diameter between 3 mm and 16 mm

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3.1.8
multiple element
ME
physical fibre separation level consisting of more than one single element

Note 1 to entry: This separation level has fibres from multiple cable elements on one splice tray and is also called mass storage. It is the lowest (worst) degree of physical circuit separation.

3.1.9
multiple ribbon
MR
multiple element consisting of multiple optical fibres (circuits) arranged in ribbons (fibres in parallel) which are arranged e.g. in stacks

3.1.10
optical fibre connector
component normally attached to a cable or piece of apparatus for the purpose of providing interconnection and disconnection of fibre optic cables

Note 1 to entry: The interconnection usually consists of two plugs mated together in an adapter or 1 plug mated in a socket.

3.1.11
passive optical component
optical component or assembly which does not require any source of energy for its operation other than optical input signals, or controls the dynamic or static characteristics of optical signals using a source of energy

Note 1 to entry: A passive optical component never generates an optical gain of signal power.

Note 2 to entry: Examples include optical attenuators and passive branching devices.

3.1.12
patchcord
length of optical fibre or cable, permanently terminated at both ends with a plug

3.1.13
pigtail
length of optical fibre or cable, permanently terminated at one end with a plug

3.1.14
protective housing
indoor and outdoor housing utilised for the storage, distribution or protection of one or more cable joints or passive or active telecom equipment

Note 1 to entry: examples of protective housings: wall boxes, cabinets, cases, optical distribution frame sub racks, closures or pedestals. A closure can be either a “sealed closure” or a “free breathing closure”

Note 2 to entry: a protective housing contains a fibre management system

3.1.15
single circuit
SC
physical fibre separation level where the optical circuit consists of one fibre (single fibre), or more than one fibre, providing all services for one subscriber

Note 1 to entry: This fibre separation level has the fibre(s) of only one customer on one splice tray. It is the highest (best) degree of physical circuit separation. Single circuit minimizes the disturbances of the operated circuits when accessing any adjacent circuit.

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3.1.16
single element
SE
physical fibre separation level in the cable subassembly comprising one or more optical fibres inside a common covering e.g. in a tube or inside one groove of a grooved cable (slotted core cable)

Note 1 to entry: A single element provides services to more than one subscriber.

Note 2 to entry: This fibre separation level has all fibres from a cable element (e.g. loose tube) on one splice tray. It is an intermediate degree of physical circuit separation (between single circuit and multiple element).

3.1.17
single ribbon
SR
physical fibre separation level with all fibres grouped in one ribbon

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

3.1.18
splice tray
structure that organises and controls storage of fibre splices in an orderly manner, together with the associated excess uncabled fibre length

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

3.1.19
street cabinet
free breathing, outdoor, above ground installed housing that is permanently attached to the ground

Note 1 to entry: A street cabinet is permanently fixed to the ground and is not specifically designed to allow cable movement (e.g. torsion, bending) during operation

3.1.20
transient loss
short term (milliseconds) reversible change of optical transmission characteristics arising from optical discontinuity, physical defects and modifications of the attenuation (e.g. bend loss) normally caused by mechanical stress

3.1.21
uncut fibre
fibres from a continuous cable with the cable sheath removed over a defined length

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

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