SLOVENSKI STANDARD
SIST EN 50411-6-1:2022

01-junij-2022

Nadomešča:
SIST EN 50411-6-1:2011

Sistemi za upravljanje z optičnimi vlakni in zaščitna ohišja za optične komunikacijske sisteme - Specifikacije izdelka - 6-1. del: Nezaščiteni mikrokanal kategorij S in A

Fibre management systems and protective housings to be used in optical fibre communication systems - Product specifications - Part 6-1: Unprotected microduct for category S and A

LWL-Spleißkassetten und -Muffen für die Anwendung in LWL-Kommunikationssystemen - Produktnormen - Teil 6-1: Ungeschützte Mikrorohre für die Kategorien S und A

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 6-1 : Microconduits non protégés pour les catégories S et A

Ta slovenski standard je istoveten z: **EN 50411-6-1:2022**

ICS:

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices

SIST EN 50411-6-1:2022 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50411-6-1

April 2022

ICS 33.180.20

Supersedes EN 50411-6-1:2011 and all of its amendments and corrigenda (if any)

English Version

Fibre management systems and protective housings to be used in optical fibre communication systems - Product specifications - Part 6-1: Unprotected microduct for category S and A

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 50411-6-1:2022) 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- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2023-03-14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 will supersede EN 50411-6-1:2011 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 50411-6-1:2021 includes the following significant technical changes with respect to EN 50411-6-1:2011:

— updated reference of cable tests EN 60794-1-21;

— more variants with different nominal outer and inner diameter added that are available on the market;

— updated the tests and test severities according to the new edition EN IEC 61753-1:2018.

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.

1 Scope

1.1 Product definition

This document contains the initial, start of life dimensional, mechanical and environmental performance requirements which an unprotected microduct are expected to meet.

1.2 Operating environment

The tests selected combined with the severities and duration are representative of an outside plant for subterranean and/or aerial environment defined by:

— ETS 300 019 class 8.1 - underground locations (without earthquake requirement);

— EN IEC 61753-1 - category A (aerial environment) and category S (subterranean environment).

1.3 Quality assurance

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

1.4 Allowed product types

This document covers all European Standards on optical fibre unprotected microducts. This includes, but is not limited to, EN 60794-5, *Optical fibre cables - Part 5: Sectional specification - Microduct cabling for installation by blowing*.

1.5 Allowed microduct connector types

This microduct standard allows the use of all European Standard microduct connectors, including: straight, reducer/enlarger stem, reducer/enlarger, close down, liquid block, liquid block with barb end, and end stop connectors. This includes EN 50411-2-8, *Fibre organizers and closures to be used in optical fibre communication systems - Product specifications - Part 2-8: Microduct connectors, for air blown optical fibres, Type 1*.

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 590, *Automotive fuels - Diesel - Requirements and test methods*

EN 60068-2-2, *Environmental testing - Part 2-2: Tests - Test B: Dry heat (IEC 60068-2-2)*

EN 60794-1-21, *Optical fibre cables - Part 1-21: Generic specification - Basic optical cable test procedures - Mechanical tests methods (IEC 60794-1-21)*

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

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)*

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

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
unprotected microduct
small, flexible, lightweight tube with an outer diameter typically less than or equal to 16 mm

Note 1 to entry: Unprotected microducts are designed to be contained within a loose or tight outer layer to form a protected microduct.

3.2
protected microduct
one or more microducts surrounded by a protective sheath and/or protected by a duct/sub-duct

Note 1 to entry: Alternatively a microduct may be regarded as protected if it has a sufficient wall thickness.

3.3
microduct optical fibre cable
optical fibre cable suitable for installation by blowing into a microduct

3.4
microduct fibre unit
fibre unit that is suitable for installation by blowing into a microduct

Note 1 to entry: It differs from a microduct optical fibre cable in that it provides less protection to the fibres that it contains.

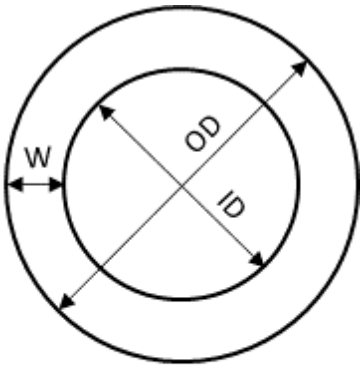
3.5
burst pressure
point at which the microduct fails to contain pressure

3.6
low friction surface
smooth or ribbed internal layer with the purpose of reducing the friction coefficient between microduct and cable/fibre unit

3.7
anti-static surface
internal layer with the purpose of reducing the antistatic forces between the microduct and the cable/fibre unit

4 Description

4.1 Unprotected microduct



OD: Outer diameter
ID: Inner diameter
W: Wall thickness

Figure 1 — Cross section of typical unprotected microduct

4.2 Microduct functions

An unprotected microduct is designed to contain one or more fibre units or optical cables.

5 Variants

Table 1 — Unprotected microduct variants

EN 50411-6-1 – X_1/X_2

X_1 Nominal outer diameter (mm)	X_2 Nominal inner diameter (mm)
3,0	2,1
4,0	2,1
4,0	2,5
4,0	3,0
5,0	2,1
5,0	3,5
6,0	2,7
6,4	4,0
7,0	3,5
7,0	4,0
7,0	5,5
8,0	3,5
8,0	4,0
8,0	4,5
8,0	5,0
8,0	6,0
10,0	6,0
10,0	8,0
12,0	8,0
12,0	9,0
12,0	9,4
12,0	10
14,0	10,0
14,0	11,0
14,0	11,4
15,0	12,0
16,0	10,0
16,0	12,0
16,0	13,0

6 Dimensions of unprotected microduct

6.1 Outer and inner diameters

The outer and inner diameters of unprotected microduct shall be in accordance with Table 2. The tolerance of outer and inner diameters shall be ± 0,1 mm for microducts with an outer diameter of ≤ 8 mm and ± 0,2 mm for the outer diameters of microducts > 8 mm up to and including 16 mm outer diameter (the inner diameter tolerance remains at ± 0,1 mm). The method used to determine microduct size shall not change the geometry of the product.

Table 2 — Unprotected microduct dimensions

Variant X_1/X_2 mm	Minimum outer diameter mm	Maximum outer diameter mm	Minimum wall thickness mm	Minimum inner diameter mm
3/2,1	2,9	3,1	0,45	2,0
4/2,1	3,9	4,1	0,95	2,0
4/2,5	3,9	4,1	0,75	2,4
4/3	3,9	4,1	0,60	2,7
5/2,1	4,9	5,1	1,45	2,0
5/3,5	4,9	5,1	0,75	3,4
6/2,7	5,9	6,1	1,55	2,6
6/4	5,9	6,1	1,00	3,9
7/3,5	6,9	7,1	1,75	3,4
7/4	6,8	7,2	1,45	3,9
7/5,5	6,9	7,1	0,75	5,4
8/3,5 [a]	7,9	8,1	2,25	3,4
8/4	7,9	8,1	2,0	3,9
8/5	7,9	8,1	1,5	4,9
8/6	7,9	8,1	1,00	5,9
8,5/6	8,4	8,6	1,25	5,9
10/6 [a]	9,8	10,2	1,95	5,9
10/8	9,8	10,2	0,95	7,9
12/8 [a]	11,8	12,2	1,95	7,9
12/9	11,8	12,2	1,45	8,9
12/9,4	11,8	12,2	1,25	9,3
12/9,8	11,8	12,2	1,00	9,8
14/10 [a]	13,8	14,2	1,95	9,9
14/11	13,8	14,2	1,45	10,9
14/11,4	13,8	14,2	1,25	11,3