SLOVENSKI STANDARD
SIST EN 50411-6-1:2011

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Delilniki za optična vlakna in kabelske spojnice za optične komunikacijske sisteme - Specifikacije izdelka - 6-1. del: Nezaščiteni mikrokanal kategorij S in A

Fibre organisers and closures 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

Ta slovenski standard je istoveten z: **EN 50411-6-1:2011**

ICS:

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices

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EUROPEAN STANDARD

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EN 50411-6-1

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English version

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

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CENELEC

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

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 86BXA, Fibre optic interconnects, passive and connectorised components.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50411-6-1 on 2011-03-21.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2012-03-21
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2014-03-21

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1 Scope

Product definition

This specification contains the initial, start of life dimensional, mechanical and environmental performance requirements which an unprotected microduct must meet. It does not address the installation capability of these products which must be agreed between the user and supplier.

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 61753-1 : category S: subterranean environment, category A: aerial environment

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.

Allowed product types

This standard covers all European Standard 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*.

Allowed microduct connector types

This microduct standard allows the use of all European Standard on 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 organisers 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 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 60793-1-51	Optical fibres - Part 1-51: Measurement methods and test procedures - Dry heat (IEC 60793-1-51)
EN 60794-1-2	Optical fibre cables - Part 1-2: Generic specification - Basic optical cable test procedures (IEC 60794-1-2)
EN 61300-2-34	Part 2-34: Tests - Resistance to solvents and contaminating fluids of interconnecting components and closures (IEC 61300-2-34)
EN 61300-3-1	Part 3-1: Examinations and measurements - Visual examination (IEC 61300-2-31)

3 Terms, definitions and abbreviations

3.1 Terms and definitions

3.1.1
unprotected microduct
small, flexible, lightweight tube with an outer diameter typically less than or equal to 16 mm

NOTE Unprotected microducts are designed to be contained within a loose or tight outer layer to form a protected microduct.

3.1.2
protected microduct
one or more microducts surrounded by a protective sheath and/or protected by a duct/sub-duct

NOTE Alternatively a microduct may be regarded as protected if it has a sufficiently high wall a thickness.

3.1.3
microduct optical fibre cable
optical fibre cable suitable for installation by blowing into a microduct

3.1.4
microduct fibre unit
fibre unit that is suitable for installation by blowing into a microduct

NOTE It differs from microduct optical fibre cables in that it provides less protection to the fibres that it contains.

3.1.5
burst pressure
point at which the microduct fails to contain pressure

3.1.6
low friction surface
smooth or ribbed internal layer with the purpose to reduce the friction coefficient between microduct and cable/fibre unit

3.1.7
anti static surface
internal layer with the purpose to reduce the antistatic forces between the microduct and the cable/fibre unit

3.2 Abbreviations

PS Product Specification

MD Microduct

PM Protected Microduct

ABF Air Blown Fibre

ID Inside Diameter

OD Outside Diameter

4 Description

4.1 Unprotected microduct

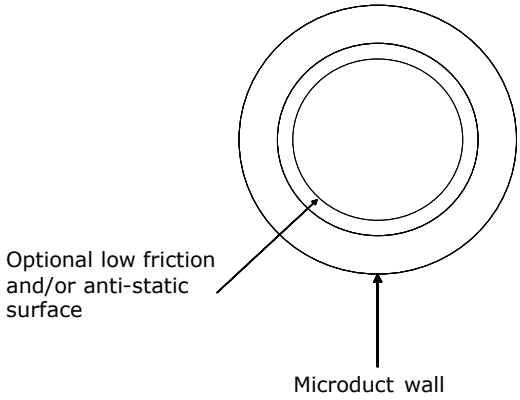

Figure 1 − Cross section of typical unprotected microduct

4.2 Microduct functions

An unprotected microduct contains one or more fibre units or optical cables.

5 Dimensions unprotected microduct

5.1 Outer and inner diameters

The OD and ID of the unprotected microduct shall be in accordance with Table 1. 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 disturb the geometry of the product.

Table 1 – Unprotected microduct dimensions

Nominal size (OD/ID) mm	OD (min.) mm	OD (max.) mm	Wall (min.) mm	ID (min.) mm
3/2,1	2,9	3,1	0,45	2,0
4/2,5	3,9	4,1	0,75	2,4
4/2,8 and 4/3	3,9	4,1	0,60	2,7
5/3,5	4.9	5,1	0,75	3.4
6/4	5,9	6,1	1,00	3,9
7/4	6,8	7,2	1,45	3,9
7/5,5	6,9	7,1	0,75	5,4
8/6	7,9	8,1	1,00	5,9
10/6 (see Note)	9,8	10,2	1,95	5,9
10/8	9,8	10,2	0,95	7,9
12/8 (see Note)	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	1,05	9,7
12/10	11,8	12,2	0,95	9,9
14/10 (see Note)	13,8	14,2	1,95	9,9
14/11	13,8	14,2	1,45	10,9
15/12	14,8	15,2	1,45	11,9
16/13	15,8	16,2	1,45	12,9

NOTE These sizes are for reference only as they are thick walled products and may be used as protected microduct (wall ≥ 2 mm); they are provided in this table for interfacing with microduct connectors EN 50411-2-8:2008.

The outer and inner dimensions may be measured using the methods shown in Annex A.

5.2 Unprotected microduct ovality

Microduct Ovality (E) shall be determined by the following equation:

$$E = [(OD_{max} – \min OD_{min})/OD_{mean}] \times 100\ \%$$

where

OD_{max} is the maximum outer diameter;

OD_{min} is the minimum outer diameter;

OD_{mean} is the mean outer diameter.

Before coiling onto the drum the maximum ovality shall be 5 % when measured prior to coiling. After dispensing product from the drum the maximum ovality shall be 15 %.

6 Materials

Unprotected microducts are typically produced from virgin LDPE, LLDPE, MDPE, HDPE or PP (no re-grind content). Other materials may be used subject to compatibility testing. Internal and external coatings may be applied to the wall material provided the tolerances and performance criteria of this specification are maintained.