SLOVENSKI STANDARD
SIST EN 50117-4-2:2016

01-februar-2016

Koaksialni kabli - 4-2. del: Področna specifikacija za kable CATV za frekvenco do 6 GHz, ki se uporabljajo v kabelskih razdelilnih omrežjih

Coaxial cables - Part 4-2: Sectional specification for CATV cables up to 6 GHz used in cabled distribution networks

Koaxialkabel - Teil 4-2: Rahmenspezifikation für CATV-Kabel bis zu 6 GHz für Kabelverteilanlagen

Câbles coaxiaux - Partie 4-2: Spécification intermédia irerelative aux câbles des réseaux câblés de télévision jusqu'à 6 GHz, utilisés dans les réseaux de distribution par câbles

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

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European foreword

This document (EN 50117-4-2:2015) has been prepared by CLC/SC 46XA "Coaxial cables" of CLC/TC 46X "Communication cables".

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) 2016-06-22
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2018-06-22

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This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

1 Scope

This sectional specification relates to EN 50117-1 and should be read in conjunction with this generic specification. This specification applies to indoor drop cables for use in cabled distribution systems operating at temperature between -40 °C and +70 °C[1)] and at frequencies between 5 MHz and 6 000 MHz and complying with the requirements of EN 50083. These cables are suitable to implement the network type Case D as depicted in Figure 1 and subclause 6.6 of EN 60728-1-1:2014.

The purpose of this European Standard is to specify the applicable test methods and requirements for the electrical, mechanical, and environmental and fire performance of the cables.

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 50117-1:2002, *Coaxial cables – Part 1: Generic specification*

EN 50289-1-6, *Communication cables – Specifications for test methods – Part 1-6: Electrical test methods – Electromagnetic performance*

EN 50289-3-9:2001, *Communication cables – Specifications for test methods – Part 3-9: Mechanical test methods – Bending tests*

EN 50290-1-2:2004, *Communication cables – Part 1-2: Definitions*

EN 50290-2-22, *Communication cables – Part 2-22: Common design rules and construction – PVC sheathing compounds*

EN 50290-2-27, *Communication cables – Part 2-27: Common design rules and construction – Halogen free flame retardant thermoplastic sheathing compounds*

prEN 50290-2-37, *Communication cables – Part 2-37: Common design rules and construction – Polyethylene insulation for coaxial cables*

prEN 50290-2-38, *Communication cables – Part 2-38: Common design rules and construction – Polyethylene insulation for coaxial cables*

EN 62153-1-1, *Metallic telecommunication cable test methods – Part 1-1: Electrical – Measurement of the pulse/step return loss in the frequency domain using the Inverse Discrete Fourier Transformation (IDFT) (IEC 62153-1-1)*

IEC 61196-1-115, *Coaxial communication cables – Part 1-115: Electrical test methods – Test for pulse return loss (regularity of impedance)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50290-1-2:2004 and EN 50117-1:2002 apply.

1) This value is valid for applications without ampacity only.

4 Requirements for cable construction

4.1 General

Designing the cable, consideration should be paid to the maximum admissible current stated in the detail specification. It is assumed that the raise of temperature of the inner conductor when submitted to the maximum current under nominal ambient conditions does not affect the mechanical and electrical properties of the cable.

4.2 Inner conductor

The conductor shall meet the requirements of 4.2 of EN 50117-1:2002, and shall be solid and can be plain or metal coated. Dimensions shall be in accordance with the detailed specification.

There shall be no joint made subsequent to the last drawing operation.

4.3 Dielectric

The dielectric material(s) shall be in accordance with 4.3 of EN 50117-1:2002 and shall consist of polyolefin materials, with prEN 50290-2-37 (polyethylene) or prEN 50290-2-38 (polypropylene). Dimensions shall be in accordance with the detail specification.

Unless otherwise specified, the nominal diameter over the dielectric should be one of the preferred values, namely 3,7 mm [2]), 4,8 mm and 7,2 mm.

4.4 Outer conductor or screen

The construction and material of the outer conductor (or screen) shall be meet the requirements of 4.4 items b), f) or g) of EN 50117-1:2002. Where option b) is used, a double braid layer is required.

For braid constructions or helically wound wires, the braid angle shall be between 15° and 45°. The coverage factor shall be greater than or equal to 65 %, or, when the cable is provided with a metal foil, greater than or equal to 25 %. These values are also valid for cables with two bi-directional layers of helically wound wires.

Dimensions shall be in accordance with the detail specification.

4.5 Filling compounds

Not applicable.

4.6 Moisture barriers

Not applicable.

4.7 Wrapping layers

Not applicable.

4.8 Sheath

Sheath material(s) shall meet the requirements of the EN 50290-2-22 for PVC or EN 50290-2-27 for halogen free flame retardant materials.

The sheath shall also meet the requirements of 4.8 of EN 50117-1:2002.

2) Smaller cables are not suitable as the attenuation at 6 GHz might be too high.

Dimensions shall be in accordance with the detail specification.

4.9 Metallic protection

Not applicable.

4.10 Cable integral suspension strand (Messenger wire)

Not applicable.

4.11 Oversheath

Not applicable.

4.12 Fauna proofing

Not applicable.

4.13 Chemical and/or environmental proofing

Not applicable.

4.14 Cable identification

4.14.1 General

Cable identification shall be in accordance with 4.14 of EN 50117-1:2002.

4.14.2 Sheath marking

Sheath marking shall be achieved as a non-degradable print containing the following minimum information:

— designation of the cable;
— attenuation value (in dB/100 m at 800 MHz, rounded);
— screening class;
— Euro-class;
— name of supplier.

EXAMPLE EN 50117-4-2 21 < XXX > Class A < YYY >

4.15 Labelling

Unless otherwise specified in the detail specification drums or coils shall be provided with a label with a non-degradable print containing the following minimum information:

— designation of the cable;
— attenuation value (in dB/100 m at 800 MHz, rounded);
— screening class;
— Euro-class;
— name of supplier;
— batch part number;
— length of cable.

EXAMPLE EN 50117-4-2 21 < XXX > Class A < YYY > 03/12 543m

5 Tests for completed cables

5.1 General

When tested in accordance with the requirements of EN 50117-1, the requirements given below shall apply.

5.2 Electrical tests

5.2.1 Low-frequency and D.C. electrical measurements

Table 1 — Low-frequency and D.C. electrical measurements

EN 50117-1 Subclause n°	Parameter	Requirements/Remarks
5.1.1.1	Conductor resistance	Applicable, value in accordance with the detail specification
5.1.1.2	Dielectric strength	2 kV D.C. or 1,5 kV A.C. for 1 min
5.1.1.3	Insulation resistance	≥ 10^4 MΩ x km
5.1.1.4	Mutual capacitance	When required, in accordance with the detail specification
5.1.1.5	Voltage test of sheath	2,5 kV A.C. or 3,75 kV D.C., unless otherwise specified in the relevant detail specification. Test in accordance with EN 50289-1-X [a]
5.1.1.6	Discharge (corona) test	Not applicable
5.1.1.7	Voltage proof	Not applicable
5.1.1.8	Power rating	Not applicable
[a] Test procedure is under consideration by CLC/SC 46XA.		

5.2.2 High-frequency electrical and transmission measurements

Table 2 — High-frequency electrical and transmission characteristics measurements

EN 50117-1 Subclause n°	Parameter	Requirements/Remarks
5.1.2.1	Velocity of propagation	May be specified for information purposes only in the detail specification.
5.1.2.2	Longitudinal attenuation (operational attenuation)	The cable shall comply at any frequency with the equation $a \cdot \sqrt{f} + b \cdot f + c$, (dB/100 m). In case of copper clad conductor material a term $d / \sqrt{f}$ should be added, to better match the curve at low frequencies. The coefficients a, b, c and d shall be given in the relevant detail specification as well as the discrete values at 200 MHz, 800 MHz, 2 483 MHz and 5 875 MHz. Note 1: *f* is in MHz. Note 2: The value of d can be calculated using k-factors as defined in EN 50290-2-1:2005, 6.5 and Tables 8 and 20.
5.1.2.3	Characteristic impedance	75 Ω ± 3 Ω