



SLOVENSKI STANDARD
SIST EN 50117-2-3:2005

01-november-2005

Koaksialni kabli – 2-3. del: Področna specifikacija za kable v kabelskih razdelilnih omrežjih – Razdelilni in povezovalni kabli za sisteme, ki delujejo v območju 5 MHz do 1.000 MHz

Coaxial cables -- Part 2-3: Sectional specification for cables used in cabled distribution networks - Distribution and trunk cables for systems operating at 5 MHz - 1 000 MHz

Koaxialkabel -- Teil 2-3: Rahmenspezifikation für Kabel für Kabelverteilanlagen - Verteiler und Linienkabel für Systeme im Bereich von 5 MHz - 1 000 MHz

Câbles coaxiaux -- Partie 2-3: Spécification intermédiaire pour câbles utilisés dans les réseaux de distribution câblés - Câbles de distribution et câbles principaux des systèmes fonctionnant à 5 MHz - 1 000 MHz

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EUROPEAN STANDARD

EN 50117-2-3

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ICS 33.120.10

English version

Coaxial cables
Part 2-3: Sectional specification for cables
used in cabled distribution networks –
Distribution and trunk cables for systems
operating at 5 MHz - 1 000 MHz

Câbles coaxiaux
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 pour les câbles utilisés dans les réseaux
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 für Kabelverteilanlagen –
 Verteiler und Linienkabel für Systeme
 im Bereich von 5 MHz - 1 000 MHz

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by SC 46XA, Coaxial cables, of Technical Committee CENELEC TC 46X, Communication cables.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50117-2-3 on 2004-09-01.

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) 2005-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2007-09-01

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1 Scope

This European Standard relates to EN 50117-1 and should be read in conjunction with this generic specification. This specification applies to distribution and trunk cables for use in cabled distribution systems operating at temperature between -40 °C and $+70\text{ °C}$ ¹⁾ and at frequencies between 5 MHz and 1 000 MHz and complying with the requirements of EN 50083.

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

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 50083 series	Cable networks for television signals, sound signals and interactive services
EN 50117-1	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	Communication cables – Specifications for test methods – Part 3-9: Mechanical test methods – Bending tests
EN 50290-1-2 ²⁾	Communication cables – Part 1-2: Definitions
EN 50290-2-23	Communication cables – Part 2-23: Common design rules and construction – PE insulation
EN 50290-2-24	Communication cables – Part 2-24: Common design rules and construction – PE sheathing
EN 50290-2-25	Communication cables – Part 2-25: Common design rules and construction – Polypropylene insulation compounds
EN 50290-2-27	Communication cables – Part 2-27: Common design rules and construction – Halogen free flame retardant thermoplastic sheathing compounds
EN 50290-4-1	Communication cables – Part 4-1: General considerations for the use of cables – Environmental conditions and safety aspects
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 ²⁾	Coaxial communication cables – Part 1-115: Electrical test methods – Test for pulse return loss (regularity of impedance)

3 Definitions

For the purposes of this European Standard, the definitions of EN 50290-1-2 and EN 50117-1 apply.

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

2) At draft stage.

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 (details are under study).

4.2 Inner conductor

The conductor shall meet the requirements of Subclause 4.2 of EN 50117-1, and shall be solid or tube. Individual wires 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 Subclause 4.3 of EN 50117-1 and shall consist of polyolefin materials, with EN 50290-2-23 (polyethylene), EN 50290-2-25 (polypropylene) or any relevant part of EN 50290-2-XX. Dimensions shall be in accordance with the detail specification.

4.4 Outer conductor or screen

The construction and material of the outer conductor and/or screen shall meet the requirements of Subclause 4.4, items c), e) or f) of EN 50117-1.

For constructions with metal foil and braid, braid angle shall be between 15° and 45°.

Dimensions shall be in accordance with the detail specification.

4.5 Filling compounds

When applicable filling compounds shall be in accordance with Subclause 4.5 of EN 50117-1.

When applicable filling compounds shall meet the requirements of the relevant detail specification.

4.6 Moisture barriers

Not applicable

4.7 Wrapping layers

Not applicable

4.8 Sheath

Sheath material(s) shall meet the requirements of EN 50290-2-24 for PE sheaths or EN 50290-2-27 for halogen free flame retardant materials.

Sheaths of cables used in aerial or external applications shall meet the requirement of the UV resistance test.

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

Dimensions shall be in accordance with the detail specification.

4.9 Metallic protection

When applicable metallic protection shall be in accordance with Subclause 4.9 of EN 50117-1.

When applicable metallic protection shall meet the requirements of the relevant detail specification.

4.10 Cable integral suspension strand (Messenger wire)

When applicable messenger wires shall be in accordance with Subclause 4.10 of EN 50117-1.

When applicable messenger wires shall meet the requirements of the relevant detail specification.

4.11 Oversheath

When applicable oversheaths shall be in accordance with Subclause 4.11 of EN 50117-1.

When applicable oversheaths shall meet the requirements of the relevant detail specification.

4.12 Fauna proofing

When applicable fauna proofing shall be in accordance with Subclause 4.12 of EN 50117-1.

When applicable fauna proofing shall meet the requirements of the relevant detail specification.

4.13 Chemical and/or environmental proofing

Not applicable

4.14 Cable identification

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

4.14.1 Sheath marking

Sheath marking shall be achieved as a non-degradable embossing or 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 50117-2-3 11 < XXX > Class A Euro-class C < YYY >

4.14.2 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 50117-2-3 11 < XXX > Class A Euro-class C < YYY > 03/04 543m

5 Tests for completed cables

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

5.1 Electrical tests

5.1.1 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	$\geq 10^4 \text{ M}\Omega \cdot \text{km}$
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.		

5.1.2 High-frequency electrical and transmission measurements

Table 2 – High-frequency electrical and transmission 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 formula $a \cdot \sqrt{f} + b \cdot f + c$. In case of copper clad conductor material a term d / \sqrt{f} should be added, to 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 and 800 MHz.
5.1.2.3	Characteristic impedance	$75 \Omega \pm 2 \Omega$

Table 2 – High-frequency electrical and transmission measurements (continued)

EN 50117-1 Subclause n°	Parameter	Requirements/Remarks
5.1.2.4	Return loss ^a	RL = 26 dB min. from 5 MHz to 30 MHz RL = 26 dB min. from 30 MHz to 470 MHz RL = 23 dB min. from 470 MHz to 1 000 MHz Measurement accuracy In case of digital signal processing, the accuracy of the return loss measurement, $\Delta a_{r,f}$, depends on the frequency step Δf in the measured frequency range. The frequency spacing in the measured frequency range is frequency dependent and shall be in accordance with the following equation: $\Delta f \leq 1,4 \cdot \frac{300 \cdot v_r}{868,6 \cdot \pi} \cdot a(f) \cdot \sqrt{10^{\frac{\Delta a_{r,f}}{10}} - 1}$ where $a(f)$ is the attenuation of the cable at the measured frequency point in dB/100 m, Δa_{r1} is the max. uncertainty of measurement due to frequency spacing; and v_r is the nominal velocity. The measurement inaccuracy $\Delta a_{r,f}$ shall be ≤ 1 dB unless otherwise stated in the relevant detail specification. ^b
5.1.2.5	Regularity of impedance	Perform on both ends of tested cable Regularity ≥ 40 dB resp ≤ 1 % Test procedure: IEC 61196-1-115, (time domain) or EN 62153-1-1, (transformation from frequency domain into time domain by IDFT). ^c
5.1.2.6	Transfer impedance	Screening Class A++: $\leq 0,9$ m Ω /m from 5 MHz to 30 MHz ^d Test procedure according to EN 50289-1-6, triaxial method, after completion of the flexure test according to 5.2.9 of this standard.
5.1.2.7	Screening attenuation	Screening Class A++: ≥ 105 dB from 30 MHz to 1 000 MHz ^d Test procedure according to EN 50289-1-6, triaxial method, after completion of the flexure test according to 5.2.9 of this standard.
^a In each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible. ^b A more detailed description of the subject is given in 46XA/Sec104/INF and 46XA/Sec105/INF. ^c EN 50289-1-X is under consideration by CLC/SC 46XA. ^d Values for Screening Class A+ and A++ are under consideration.		