

# SLOVENSKI STANDARD

## SIST EN 50117-11-1:2019

01-junij-2019

### Nadomešča:

SIST EN 50117-2-3:2005

SIST EN 50117-2-3:2005/A1:2008

SIST EN 50117-2-3:2005/A2:2013

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**Koaksialni kabli - 11-1. del: Področna specifikacija za koaksialne kable za analogni in digitalni prenos signala - Razdelilni in povezovalni kabli za sisteme, ki delujejo v območju od 5 MHz do 1 000 MHz**

Coaxial cables - Part 11-1: Sectional specification for coaxial cables for analogue and digital signal transmission - Distribution and trunk cables for systems operating at 5 MHz - 1 000 MHz

Koaxiale Kabel - Teil 11-1: Rahmenspezifikation für koaxiale Kabel für analoge und digitale Signalübertragung – Verteiler und Linienkabel für Systeme im Bereich von 5 MHz - 1 000 MHz

Câbles coaxiaux - Partie 11-1: Spécification intermédiaire pour câbles coaxiaux pour la transmission de signaux analogiques et numériques - Câbles de distribution et de transport pour les systèmes fonctionnant entre 5 MHz et 1 000 MHz

**Ta slovenski standard je istoveten z: EN 50117-11-1:2019**

### ICS:

33.120.10 Koaksialni kabli. Valovodi Coaxial cables. Waveguides

**SIST EN 50117-11-1:2019 en**

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EUROPEAN STANDARD

**EN 50117-11-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2019

ICS 33.120.10

Supersedes EN 50117-2-3:2004

English Version

## Coaxial cables - Part 11-1: Sectional specification for coaxial cables for analogue and digital signal transmission - Distribution and trunk cables for systems operating at 5 MHz - 1 000 MHz

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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 50117-11-1:2019) 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) 2019-09-29
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2022-03-29

This document supersedes EN 50117-2-3.

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.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

All materials used for cables according to this standard should fulfil the requirements of the current REACH Regulation and ROHS Directive.

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**EN 50117-11-1:2019 (E)****1 Scope**

This part of EN 50117 which is a sectional specification applies to coaxial distribution and trunk cables for analogue and digital one and two way signal transmission, e.g. for cable networks for television signals, sound signals and interactive services in accordance with EN 60728-1, EN 60728-1-1, EN 60728-101, EN 60728-10, EN 50173-1 and EN 50173-4. This includes also the transmission of BCT signals provided by a CATV, MATV or SMATV cable network.

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

**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 50117-1:2019, *Coaxial cables - Part 1: Generic specification*

EN 50173-1, *Information technology - Generic cabling systems - Part 1: General requirements*

EN 50173-4, *Information technology - Generic cabling systems - Part 4: Homes*

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 50290-2-1:2005, *Communication cables - Part 2-1: Common design rules and construction*

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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*

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

EN 50290-2-38, *Communication cables - Part 2-38: Common design rules and construction - Polypropylene insulation for coaxial cables*

EN 50290-4-1:2014, *Communication cables - Part 4-1: General considerations for the use of cables - Environmental conditions and safety aspects*

EN 50290-4-2:2014, *Communication cables - Part 4-2: General considerations for the use of cables - Guide to use*

EN 60728-1, *Cable networks for television signals, sound signals and interactive services - Part 1: System performance of forward paths (IEC 60728-1)*

EN 60728-1-1, *Cable networks for television signals, sound signals and interactive services - Part 1-1: RF cabling for two way home networks (IEC 60728-1-1)*

EN 60728-10, *Cable networks for television signals, sound signals and interactive services - Part 10: System performance for return paths (IEC 60728-10)*

EN 60728-101, *Cable networks for television signals, sound signals and interactive services - Part 101: System performance of forward paths loaded with digital channels only (IEC 60728-101)*

EN 62153-1-1, *Metallic communication cables 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 61196-1-112, *Coaxial communication cables - Part 1-115: Electrical test methods - Test for return loss (uniformity of impedance)*

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

IEC 62153-4-3, *Metallic communication cable test methods - Part 4-3: Electromagnetic compatibility (EMC) - Surface transfer impedance - Triaxial method*

IEC 62153-4-4, *Metallic communication cable test methods - Part 4-4: Electromagnetic compatibility (EMC) - Test method for measuring of the screening attenuation as up to and above 3 GHz, triaxial method*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50290-1-2:2004, EN 50117-1:2019 and the following apply.

#### 3.1 distribution and trunk cable

coaxial cable which is used to connect from:

- a) head end to head end,
- b) head end to amplifier,
- c) amplifier to amplifier,
- d) amplifier to splitter or directional coupler,
- e) splitter, directional coupler or subscriber tap to splitter, directional coupler or subscriber tap

Note 1 to entry: For systems which use an integrated directional coupler and system outlet (looped system outlet), the interconnection cables shall be defined as trunk and distribution cables.

### 4 Requirements for cable construction and design

#### 4.1 General

Cables according to this standard are designed for an operating temperature range from  $-40\text{ }^{\circ}\text{C}$  to  $+70\text{ }^{\circ}\text{C}$ <sup>1)</sup> and at frequencies between 5 MHz and 1 000 MHz.

When designing the cable, consideration should be given 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.

<sup>1)</sup> This value is valid for applications without ampacity only, see also Table A.1 concerning max. DC current.

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Cables according to this standard may be operated at voltages > 50 V AC or > 75 V DC according to the detail specification of the manufacturer. However, these cables are not intended for direct connection to the mains electricity supply or other low impedance sources.

Cables according to this standard shall be designed according to EN 50290-2-1, *Communication cables Part 2-1: Common design rules and construction*. They shall be used according to EN 50290-4-1, *Communication cables - Part 4-1: General considerations for the use of cables - Environmental conditions and safety aspects*.

The use of cables according to this standard including delivery, storage and installation shall be in accordance with EN 50290-4-2, *Communication cables - Part 4-2: General considerations for the use of cables - Guide to use*, unless otherwise specified.

Cables according to this standard shall be tested for voltage withstanding. The test is performed between conductors and between the conductors or screen and the outer surface of the sheath.

Care shall be taken during assembly of the cables due to sharp edges from foils or bands. Assembling of the cables according to this standard shall be performed by professional staff only, using suitable tools.

When constructed in accordance with EN 50290-2-1 and EN 50117-1 and submitted to spark testing, CATV cables according to this standard may be installed together with Low Voltage cables.

All cables covered by this standard do not fall under the scope of the RED or the EMC directive. Nevertheless, transfer impedance and screening attenuation according to 5.1.3.6 and 5.1.3.7 shall be specified in the relevant detail specification, if the intended application of the cable is the use in combination with equipment under the RED or the EMC Directive.

**4.2 Inner conductor**

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The conductor shall meet the requirements of 4.2 of EN 50117-1:2019, and shall be solid or tube. Individual wires may 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.

In case of metal coated conductor, consideration shall be taken for the compatibility of the connector

**4.3 Dielectric**

The dielectric material(s) shall be in accordance with 4.3 of EN 50117-1:2019 and shall consist of polyolefin materials, with EN 50290-2-37 (polyethylene), EN 50290-2-38 (polypropylene). 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 4.4, items c), e) or f) of EN 50117-1:2019.

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

Dimensions and minimum wall thickness shall be in accordance with the detail specification.

**4.5 Filling compounds**

If applicable, filling compounds shall be in accordance with 4.5 of EN 50117-1:2019.

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

**4.6 Moisture barriers**

If applicable, in accordance with the relevant detail specification.



#### 4.7 Wrapping layers

Not applicable.

#### 4.8 Sheath

Sheath material(s) shall meet the requirements of the EN 50290-2-22 for PVC, EN 50290-2-24 for PE 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 4.8 of EN 50117-1:2019.

Sheath colour shall be agreed between the provider and the customer.

Dimensions and minimum wall thickness shall be in accordance with the detail specification.

#### 4.9 Metallic protection

When applicable, metallic protection shall be in accordance with 4.9 of EN 50117-1:2019.

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 4.10 of EN 50117-1:2019.

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

#### 4.11 Oversheath

When applicable, oversheaths shall be in accordance with 4.11 of EN 50117-1:2019.

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 4.12 of EN 50117-1:2019.

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

##### 4.14.1 General

Cable identification shall be in accordance with 4.14 of EN 50117-1:2019.

##### 4.14.2 Sheath marking

Sheath marking shall be achieved as a non-degradable embossing or print with a distinctive mark every meter of cable 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 50117-11-1 11 < XXX > Class A Euro-class C < YYY > .