SLOVENSKI STANDARD
SIST EN 50289-4-16:2016

01-november-2016

Nadomešča:

SIST EN 50289-4-16:2012

Komunikacijski kabli - Specifikacije za preskusne metode - 4-16. del: Preskusne metode za okolje - Celovitost tokokroga v požarnih razmerah

Communication cables - Specifications for test methods - Part 4-16: Environmental test methods - Circuit integrity under fire conditions

Kommunikationskabel - Spezifikationen für Prüfverfahren - Teil 4-16: Umweltprüfverfahren - Funktionserhalt im Brandfall

Câbles de communication - Spécifications des méthodes d'essais - Partie 4-16: Méthodes d'essais d'environnement - Intégrité du circuit en cas d'incendie

Ta slovenski standard je istoveten z: EN 50289-4-16:2016

ICS:

19.040	Preskušanje v zvezi z okoljem	Environmental testing
33.120.10	Koaksialni kabli. Valovodi	Coaxial cables. Waveguides

SIST EN 50289-4-16:2016 en

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50289-4-16

September 2016

ICS 33.120.10

Supersedes EN 50289-4-16:2012

English Version

Communication cables - Specifications for test methods - Part 4-16: Environmental test methods - Circuit integrity under fire conditions

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 50289-4-16:2016 E

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European foreword

This document (EN 50289-4-16:2016) has prepared by 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)	2017-07-22
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2019-07-22

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This document supersedes EN 50289-4-16:2012.

1 Scope

This European Standard, part of EN 50289, specifies the criteria for circuit integrity of control and communication cables – wires, symmetric cables, and coaxial cables with metallic conductors for use in e.g. telecommunication, data transmission, radio frequency, video communication and signalling and control equipment.

The test method is described in EN 50200 and/or EN 50577.

It is essential to use this European Standard with EN 50200 and/or EN 50577 for CPR purpose.

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, *Coaxial cables — Part 1: Generic specification*

EN 50200:2006, *Method of test for resistance to fire of unprotected small cables for use in emergency circuits*

EN 50288-1, *Multi-element metallic cables used in analogue and digital communication and control — Part 1: Generic specification*

EN 50289 (all parts), *Communication cables — Specifications for test methods*

EN 50577, *Electric cables — Fire resistance test for unprotected electric cables (P classification)*

EN 13501-3:2005+A1:2009, *Fire classification of construction products and building elements — Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers*

3 Circuit Integrity

3.1 General

The criteria that are used for defining fire resistant cables are deemed to demonstrate the ability of the cable to provide circuit integrity when subjected to fire.

Circuit integrity **(continuity of signal supply)** is based upon the maximum frequency for which the cable is specified in combination with the related transmission performances.

Compliance with this standard is not an indication that the cable will suite all types of applications or attack by any fire scenario. It only ensures that the circuit integrity as defined in Table 1 is maintained.

This clause specifies characteristics that shall be used to define the continuous maintenance of circuit integrity under fire conditions for communication cables.

The High Frequency Circuit Integrity is deemed to be maintained if the transmission characteristics at the maximum frequency, given in Table 1 below for EN 50200 burner and for EN 50577 Furnace test, remains within the stated limits.

The degradation allowed is normalised to % per metre as the burner in EN 50200 is 1 m and EN 50577 has > 2,5 m exposed to heat.

Table 1 — Single and multipairs Maximum frequency required tests and requirements

Maximum Frequency	High frequency characteristics[b]	Test method	Requirements for circuit integrity
< 100 KHz	Dielectric strength Capacity	EN 50289-1-3, EN 50289-1-5	No short circuit/ 100V DC 70V AC Maximum difference < 30 %
> 100 KHz < 100 MHz	Dielectric strength Attenuation NEXT	EN 50289-1-3 EN 50289-1-8 EN 50289-1-X	No short circuit/ 100V DC 70V AC Maximum difference< 12,5 % > 26-15 Log10 (f/10) dB 1 to 10 MHz
> 100 MHz < 1000 MHz	Dielectric strength Attenuation, RL NEXT	EN 50289-1-3 EN 50289-1-8 EN 50289-1-11 EN 50289-1-10	No short circuit/ 100V DC 70V AC Maximum difference < 12,5 % > 8 dB > 26-15 Log10 (f/10) dB 1 to 10 MHz

[a] with the exception of EN 50288-7 and EN 50288-8.

[b] Discussions between Customer and Producer necessary when System requirements demand other characteristic's limits.

High frequency characteristics shall be tested in accordance with EN 50288-1 for symmetrical cables.

Table 2 — Coax maximum frequency required tests and requirements

Maximum Frequency	High frequency characteristics[b]	Test method	Requirements for circuit integrity
< 100 KHz	Dielectric strength Capacity	EN 50289-1-3, EN 50289-1-5	No short circuit/ 100V DC 70V AC Maximum difference < 30 %
> 100 KHz < 100 MHz	Dielectric strength Attenuation NEXT	EN 50289-1-3 EN 50289-1-8 EN 50289-1-X	No short circuit/ 100V DC 70V AC Maximum difference< 12,5 % > 26-15 Log10 (f/10) dB 1 to 10 MHz
> 100 MHz < 1000 MHz	Dielectric strength Attenuation, RL NEXT	EN 50289-1-3 EN 50289-1-8 EN 50289-1-11 EN 50289-1-10	No short circuit/ 100V DC 70V AC Maximum difference < 12,5 % > 8 dB > 26-15 Log10 (f/10) dB 1 to 10 MHz

[a] with the exception of EN 50288-7 and EN 50288-8.

[b] Discussions between Customer and Producer necessary when System requirements demand other characteristic's limits.

High frequency characteristics shall be tested in accordance with EN 50117-1 for coaxial cables.

3.2 Circuit integrity classification

Details regarding classification using data from this test are given in EN 13501-3:2005+A1:2009. Information regarding classification is given in EN 50200:2006, Annex D "Information regarding classification".

Test longer than those classified can be declared without the classification

4 Test procedure

4.1 Preliminary tests

All cables shall be tested with EN 50289, electrical and mechanical tests as required by their relevant sectional specification before proceeding to the fire tests.

4.2 EN 50200

The burner, temperature, test duration etc shall be as described in EN 50200.

4.3 EN 50577

The burner, temperature, test duration etc shall be as described in EN 50577. Length of cable to be tested inside the furnace should be defined depending on the chosen installation route. Bending radius, tray type and clips used shall be reported.

4.4 Electrical test during fire

A sample greater than 30 m shall be used and set up in the following way:

For the EN 50200 test the shortest route from the burner to the test equipment shall be ≤ 10 m, the remaining 20 m shall be either coiled (≥ 1,0 m Ø coil) or laid straight in to the other side of the test equipment.

For the EN 50577 test the route from the furnace building to the test equipment shall be 15 m, and each length outside the furnace housing shall be either coiled (≥ 1,0 m Ø coil) or laid straight in to the other side of the test equipment.

During the application of fire, when the lengths are exposed either 1m in EN 50200 and > 2,5 m in EN 50577, the parameters listed in Table 1 shall be periodically monitored according to the relevant method of EN 50289-1 series.

Table 3 — Maximum Period between each measurement

0 -30 min	30 -120 min
5 min	10 min

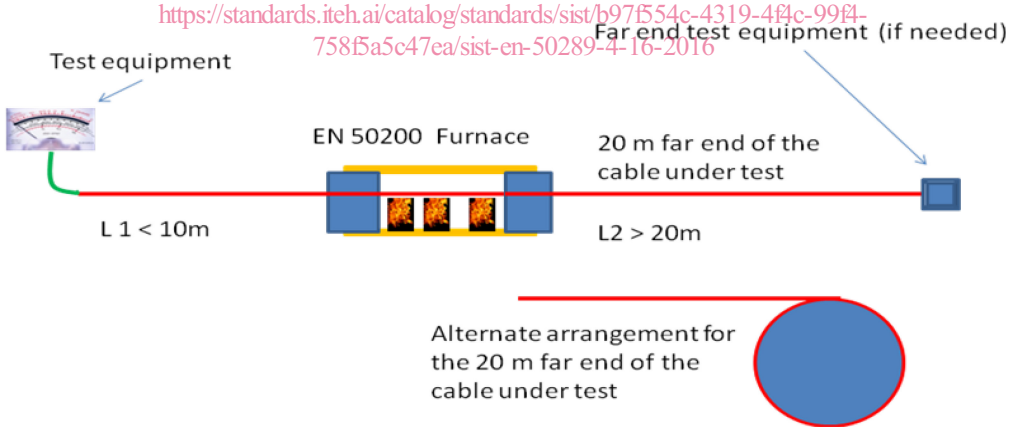

Figure 1 — Test fixture for EN 50200

5 Requirements

During and after the application of fire, the degradation of parameters listed in Table 1 shall not be worse than the value given in the same table.

The duration of survival is measured in minutes from the start to the point of failure when the degradation of parameters exceeds the values given in Table1; it shall be recorded for each cable tested up to a maximum survival time of 120 min.

6 Test report

The test report shall include the following information:

1. full description of cable tested;
2. manufacturer of cable tested;
3. test laboratory;
4. test equipment or devices used;
5. type and disposition of clips supporting cable sample tested to EN 50200 or type of trays and plastic ties supporting cable sample tested to EN 50577;
6. the actual cable bending radius, clips and tray type used for the test;
7. method used for temperature monitoring during the verification procedure;
8. the duration of survival achieved;
9. the number of this EN.