



SLOVENSKI STANDARD

SIST EN 50290-4-1:2002

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Communication cables - Part 4-1: General considerations for the use of cables - Environmental conditions and safety aspects

Communication cables -- Part 4-1: General considerations for the use of cables - Environmental conditions and safety aspects

Kommunikationskabel -- Teil 4-1: Allgemeine Betrachtungen für die Anwendung der Kabel - Bedingungen der Umgebung und Sicherheitsaspekte

Câbles de communication -- Partie 4-1: Considérations générales pour l'utilisation des câbles - Conditions d'environnement et aspects d'installation

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Environmental conditions and safety aspects

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CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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 the 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 50290-4-1 on 2001-05-01.

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) 2002-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-04-01

This European Standard has been prepared under the European Mandate M/212 given to CENELEC by the European Commission and the European Free Trade Association.

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1 Scope

This Part 4-1 of the European Standard EN 50290 gives the environmental conditions and safety aspects of symmetrical, coaxial and optical cables used for the infrastructure of communication and control networks.

It is to be read in conjunction with EN 50290-1-1 and is completed by generic, sectional, family and detail specifications, as appropriate, to describe in a detailed manner each type of cable with its specific characteristics.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 50289	series	Communication cables - Specifications for test methods
EN 50290-1-21)		Communication cables – Part 1-2: Definitions
EN50290-2-2x	series	Communication cables – Part 2-2x: Common design rules and construction
EN 60068-2-6	1995	Environmental testing - Part 2: Tests - Test Fc: Vibration (sinusoidal) (IEC 60068-2-6:1995 + corr.) https://standards.iteh.ai/catalog/standards/sist/42859ce4-fbb3-4dc2-b8d2-d63eb26e7680/sist-en-50290-4-1-2002
EN 60068-2-11	1999	Environmental testing - Part 2: Tests - Test Ka: Salt mist (IEC 60068-2-11:1981)
EN 60068-2-14	1999	Environmental testing - Part 2: Tests - Test N: Change of temperature (IEC 60068-2-14:1984 + A1:1986)
EN 60068-2-27	1993	Basic environmental testing procedures - Part 2: Tests - Test Ea and guidance: Shock (IEC 60068-2-27:1987)
EN 60068-2-29	1993	Basic environmental testing procedures - Part 2: Tests - Test Eb and guidance: Bump (IEC 60068-2-29:1987 + corr.)
HD 323.2.3 S2	1987	Basic environmental testing procedures - Part 2: Tests - Test Ca: Damp heat, steady state (IEC 60068-2-3:1969 + A1:1984)
IEC 60068-2-42	1982	Environmental Testing - Part 2: Tests - Test Kc: Sulphur dioxide test for contacts and connections

3 Definitions

For the purpose of this European Standard, the definitions of EN 50290-1-2 apply.

1) At draft stage.

4 Environmental conditions and installation aspects

4.1 General

The reliability of the cables and their expected life time depend upon how the environmental conditions (during storage, installation and operation) are taken into account in their design.

The following subclauses address environmental aspects that can impact the reliability of the communication cables.

4.2 Relationship with EC directives

4.2.1 EMC Directive

Though cables as products are not under the scope of the EMC directive, they are used to interconnect apparatus as described in the directive.

The equipment supplier, system designer and operators must be aware that the interconnection of cables may affect the overall system EMC performance.

Mitigation practices as developed in some installation guides can decrease the level of electromagnetic influence.

To help the systems users and the designers to fulfil the EMC directive requirements by an adequate choice of cables, the electromagnetic behaviour of each cable shall be given in the relevant specification and described by screening performance and balanced properties.

4.2.2 Low voltage directive

Depending upon the actual application for which they are used, communication and control cables may have to carry signals, the voltage of which can exceed DC 100 V or AC 75 V.

These cables fall under the low voltage directive and have to be designed, tested and marked accordingly.

The relevant cable specification shall take into account the requirements of the low voltage directive.

4.2.3 Construction product directive

Communication and control cables fall under the scope of the construction product directive, when permanently installed in buildings.

In case where CPD applies consideration shall be taken to the following:

- resistance to fire where applicable (e.g. for fire alarm systems, fire fighting support systems,...);
- reaction to fire;
- durability;
- release of dangerous substances under normal circumstances.

4.2.3.1 Resistance to fire

ffs

4.2.3.2 Reaction to fire

ffs

4.2.3.3 Durability

The relevant cable specification shall include mechanical and environmental requirements to be tested in accordance with EN 50289-3 and EN 50289-4 (see 4.3).

Durability is presumed to be demonstrated when the cables pass the mechanical and environmental tests as given in the sectional specification.

4.2.3.4 Release of dangerous substances

During the normal operating life of the cable there shall be no release of dangerous substances given in the updated list of the Council Directive 76/769/EEC.

Cables using materials according to EN 50290-2-2X series comply with this requirement.

Other materials shall be subjected to the appropriate tests.

4.3 Environmental conditions

4.3.1 Relationship between environmental conditions and severities of testing

4.3.1.1 General

The purpose of environmental engineering is to render the product and the environment compatible. It should take all economic and technical aspects into consideration and thereby choose the best test methods and correct severities for the evaluation of the product's ability to comply with the environmental conditions. A test program for the product is defined whereby the test sequence together with the test methods and limits are specified.

4.3.1.2 Environmental conditions

The environmental conditions must be evaluated by measurements or by other information available so that statistically probable characteristic values can be established corresponding to the highest possible constraints. Each situation has an environment of its own but it is not reasonable to prescribe individual products having slightly different withstand properties for each individual situation. It is necessary to combine these environments into a class forming an envelope of related environments. It is only necessary to take into account those parameters that influence the performance of the product. The environment must cover all the conditions that occur during the life of the product, i.e. storage, transportation, handling and use.

4.3.1.3 Environmental testing

The purpose of an environmental test is to demonstrate that a product under defined environmental conditions can survive without permanent failure and function according to specification. The severity of the test to be selected will depend on the characteristic values obtained for the parameters, the failure mechanism, the ageing factor, if known and the consequences of failure. The latter will have been studied by the utilization of the particular product and depends on its application. This means that the severity of the test can be raised or lowered according to the criticality of the product. If the sampling of the product suggests wide variations in its ability to withstand the environment the level of testing should be increased. If the distribution of environmental constraints and the resistance to the environment of a lot tested are suspected to partially overlap, the test levels can be raised to clarify this weakness.

4.3.2 Climatic environment and severities for environmental tests

An environmental test can be performed for many purposes. In most of cases the environmental tests are one part of the qualification approval tests. In this case a test of resistance to the environment demonstrates the ability of the product to function under constraints or withstand stated constraints.

There are, however, inherent limitations due to the fact that the test is usually carried out on a few samples. The results give protection to a particular design but not to an individual product. The successful test will ensure that the product as a type is capable of withstanding the expected environments. Different kinds of tests and severity levels are necessary for product reliability and endurance.

An outline of the action needed for the preparation of an environmental test specification is given in Figure 1.

4.3.2.1 Climatic sequence

The test shall be performed according to EN 50289-4-5. Unless otherwise required in the sectional or detail specification one of the following recommended severities shall be selected:

low temperature: - 10 °C - 15 °C - 25 °C - 40 °C - 45 °C
high temperature: + 60 °C + 70 °C + 85 °C + 125 °C + 155 °C + 200 °C
duration: 10, 21 days.

4.3.2.2 Damp heat steady state

This test shall be carried out in accordance with test Ca of HD 323.2.3 S2 with the specific conditions as described in EN 50289-4-7.

Unless otherwise required in the sectional or detail specification, the following recommended severity shall be selected:

duration: 10 days.

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