



SLOVENSKI STANDARD

SIST EN 50289-4-6:2002

01-september-2002

Communication cables - Specifications for test methods - Part 4-6: Environmental test methods - Temperature cycling

Communication cables - Specifications for test methods -- Part 4-6: Environmental test methods - Temperature cycling

Kommunikationskabel - Spezifikationen für Prüfverfahren -- Teil 4-6: Umweltprüfverfahren - Temperaturwechselprüfung

Câbles de communication - Spécifications des méthodes d'essai -- Partie 4-6: Méthodes d'essais d'environnement - Cycles thermiques

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ICS:

33.120.10 Koaksialni kabli. Valovodi Coaxial cables. Waveguides

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en

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EUROPEAN STANDARD

EN 50289-4-6

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2001

ICS 33.120.10

English version

**Communication cables –
Specifications for test methods
Part 4-6: Environmental test methods –
Temperature cycling**

Câbles de communication –
Spécifications des méthodes d'essai
Partie 4-6: Méthodes d'essais
d'environnement –
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Kommunikationskabel –
Spezifikationen für Prüfverfahren
Teil 4-6: Umweltprüfverfahren -
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This European Standard was approved by CENELEC on 2001-05-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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 50289-4-6 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 4-6 of EN 50289 details the method of test to determine the temperature cycling used in analogue and digital communication systems.

It is to be read in conjunction with Part 4-1 of EN 50289, which contains essential provisions for its application.

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 50289-4-1	2001	Communication cables - Specifications for test methods – Part 4-1: Environmental test methods - General requirements
EN 50290-1-2 ¹⁾		Communication cables – Part 1-2: Definitions
EN 60068-2-14		Environmental testing – Part 2: Tests – Test N: Change of temperature (IEC 60068-2-14)

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3 Definitions

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

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4 Test methods

4.1 Equipment

- a) Appropriate transmission measuring apparatus for determination of changes in transmission performance.
- b) Climatic chamber

The climatic chamber shall be of a suitable size to accommodate the sample and its temperature shall be controllable to remain within ± 3 K of the specified testing temperature. One example of a suitable chamber is given in clause 2, test Nb, of EN 60068-2-14.

4.2 Test sample

The sample shall be of sufficient length as indicated in the detail specification to achieve the desired accuracy.

In order to gain reproducible values, it may be necessary for the cable sample to be brought into the climatic chamber as a loose coil or on a reel.

¹⁾ At draft stage.

General recommendations are:

- The winding diameter shall be large enough to maintain the ability of the cable to accommodate differential expansion and contraction. A winding diameter substantially greater than the value selected for cable delivery may be necessary.
- Any risk of cable expansion (or contraction) limitation created by conditioning shall be suppressed. In particular special care should be taken to avoid residual tension on the cable during the test. For example a tight winding on a drum is not recommended as it can limit cable contraction at low temperature. On the other hand, a tight multilayer winding can limit expansion at high temperature.
- The use of loose winding is recommended such as large diameter coils, cushioned reels with a soft layer of zero tension facility device, etc.
- For optical cables, in order to limit the length of the cable under test, it is permissible to connect several fibres of the cable and to measure the connected fibres. The number of connections shall be limited and they should be located outside the climatic chamber. A sufficient number of fibres distributed over the cable structure should be tested, as defined in the Detail Specification.

4.3 Procedure

4.3.1 Initial measurement

The sample shall be visually inspected and a basic value for the transmission parameters at the initial temperature shall be determined.

Pre-conditioning conditions shall be agreed between customer and supplier.

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4.3.2 Cycling

- a) The sample at ambient temperature shall be introduced into the climatic chamber that is at the same temperature.
- b) The temperature in the chamber shall then be lowered to the appropriate low temperature T_A at the appropriate rate of cooling.
- c) After temperature stability in the chamber has been reached, the sample shall be exposed to the low temperature conditions for the appropriate period t_1 .
- d) The temperature in the chamber shall then be raised to the appropriate high temperature T_B at the appropriate rate of heating.
- e) After temperature stability in the chamber has been reached, the sample shall be exposed to the high temperature conditions for the appropriate period t_1 .
- f) The temperature in the chamber shall then be lowered to the ambient temperature at the appropriate rate of cooling.
- g) This procedure constitutes one cycle (see Figure 1).
- h) The sample shall be subjected to two cycles unless otherwise required in the relevant detail specification.
- i) Before removal from the chamber, the sample under test shall have reached temperature stability at ambient temperature.
- j) If the relevant detail specification indicates different temperature ranges for storage and used, instead of two separate tests, a combined test procedure is allowed in accordance with figure 2.

4.3.3 Recovery

If the ambient temperature is not the standard atmospheric condition to be used for testing after removal from the chamber, the sample shall be allowed to attain temperature stability at this latter condition.

The relevant Detail Specification may call for a specific recovery period for a given type of sample.

4.4 Requirements

The acceptance criteria for the test shall be as stated in the Detail Specification.

4.5 Details to be specified

- the permissible change of transmission parameter and inspection checks during cycling;
- transmission parameters to be measured;
- values of T_A , T_B and t_1 and the rate of cooling or heating;
- number of cycles;
- humidity levels at each temperature extreme (if any);
- recovery period.

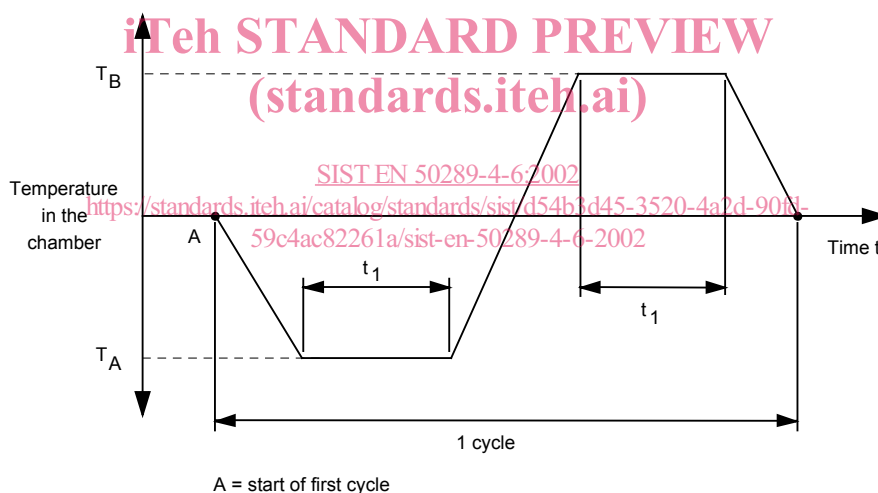


Figure 1 - One cycle procedure