



**SLOVENSKI STANDARD**  
**SIST EN 50289-4-5:2008**  
**01-april-2008**

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**Komunikacijski kabli - Specifikacije za preskusne metode - 4-5. del: Metode za preskušanje vplivov okolja - Klimatsko zaporedje**

Communication cables - Specifications for test methods - Part 4-5: Environmental test methods - Climatic sequence

Kommunikationskabel - Spezifikationen für Prüfverfahren - Teil 4-5: Umweltprüfverfahren - Klimawechsel

**iTeh STANDARD PREVIEW**

Câbles de communication - Spécifications des méthodes d'essais - Partie 4-5: Méthodes d'essais d'environnement - Séquence climatique

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**Ta slovenski standard je istoveten z: EN 50289-4-5:2008**

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**ICS:**

33.120.10

**SIST EN 50289-4-5:2008**

**en,de**

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EUROPEAN STANDARD

**EN 50289-4-5**

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2008

ICS 33.120.10

English version

**Communication cables -  
Specifications for test methods -  
Part 4-5: Environmental test methods -  
Climatic sequence**

Câbles de communication -  
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Partie 4-5: Méthodes d'essais  
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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.

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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 the Technical Committee CENELEC TC 46X, Communication cables.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50289-4-5 on 2007-09-01.

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) 2008-09-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2010-09-01

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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## Contents

<b>1</b>	<b>Scope .....</b>	<b>4</b>
<b>2</b>	<b>Normative references .....</b>	<b>4</b>
<b>3</b>	<b>Definitions.....</b>	<b>4</b>
<b>4</b>	<b>Test methods .....</b>	<b>4</b>
4.1	Equipment .....	4
4.2	Test sample .....	4
4.3	Procedure .....	5
4.4	Requirements.....	6
4.5	Details to be specified .....	6
<b>5</b>	<b>Test report .....</b>	<b>6</b>
	Figure 1 – One cycle procedure.....	7

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## 1 Scope

This Part 4-5 of EN 50289 details the method of test to determine the stability of transmission performance of a finished cable used in analogue and digital communication systems when submitted to temperature changes which may occur during use, storage or transportation.

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

## 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 50289-4-1	2001	Communication cables - Specifications for test methods Part 4-1: Environmental test methods - General requirements
EN 50290-1-2	2004	Communication cables – Part 1-2: Definitions
EN 60068-2-14	1999	Environmental testing - Part 2: Tests - Test N: Change of temperature (IEC 60068-2-14:1984 + A:1986)

## 3 Definitions

[SIST EN 50289-4-5:2008  
https://standards.iteh.ai/catalog/standards/sist/1cea7ec5-13cd-42f8-93c4-090597815269/en-50289-4-5:2008](https://standards.iteh.ai/catalog/standards/sist/1cea7ec5-13cd-42f8-93c4-090597815269/en-50289-4-5:2008)

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

## 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  $\pm 3$  K of the specified testing temperature. It must incorporate means of admitting water vapour to, or generating water vapour within. 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 relevant cable 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.

General recommendations are:

- the winding diameter shall be large enough to maintain the ability of the cable to accommodate differential expansion and contraction. The winding diameter should not be greater than the winding diameter used for the delivery;
- 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 relevant cable 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.

#### 4.3.2 Cycling

**4.3.2.1** The sample at ambient temperature shall be introduced into the climatic chamber that is at the same temperature.

**4.3.2.2** The temperature in the chamber shall then be lowered to the appropriate low temperature  $T_A$  at the appropriate rate of cooling.

**4.3.2.3** After temperature stability in the chamber has been reached, the sample shall be exposed to the low temperature conditions for the appropriate period  $t_1$ .

**4.3.2.4** The temperature in the chamber shall then be raised to the appropriate high temperature  $T_B$  at the appropriate rate of heating.

**4.3.2.5** After temperature stability in the chamber has been reached steam shall be admitted to or generated in the chamber. The humidity shall be maintained at > 95 %, the sample shall be exposed to the high temperature conditions for the appropriate period  $t_1$ .

**4.3.2.6** The temperature in the chamber shall then be lowered to the ambient temperature at the appropriate rate of cooling.

**4.3.2.7** This procedure constitutes one cycle (see Figure 1).

**4.3.2.8** The sample shall be subjected to ten cycles unless otherwise required in the relevant cable specification.

**4.3.2.9** Before removal from the chamber, the sample under test shall have reached temperature stability at ambient temperature.

**4.3.2.10** If the relevant cable specification indicates different temperature ranges for storage and use, instead of two separate tests, a combined test procedure is allowed.

### 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 cable 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 relevant cable specification.

## 4.5 Details to be specified

- the permissible change of transmission parameter and inspection cheeks during cycling;
- transmission parameters to be measured (they may include attenuation, electrical length...);
- values of  $T_A$ ,  $T_B$  and  $t_1$  and the rate of cooling or heating;
- number of cycles if different of ten;
- recovery period.

## 5 Test report

The test report shall include

- the period(s) at which inspection checks are carried out,
- cable sample length,
- type of winding:
  - coil, reel, other... (to be stated; in case of a cushioned reel, the type of cushioning and material used);
  - winding diameter;
  - single or multilayer winding;
  - winding tension and zero tension facility device (if any),
- type of measurement equipment,
- temperature cycle diagram,
- change of transmission parameters as a function of temperature cycling,
- pass/fail criteria.