

Environmental testing - Part 2: Tests - Test N: Change of temperature

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of temperature

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60068-2-14:2002 sisaldab Euroopa standardi EN 60068-2-14:1999 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 18.12.2002 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on .

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 60068-2-14:2002 consists of the English text of the European standard EN 60068-2-14:1999.

This standard is ratified with the order of Estonian Centre for Standardisation dated 18.12.2002 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text .

The standard is available from Estonian standardisation organisation.

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Võtmesõnad:

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English version

Environmental testing
Part 2: Tests - Test N: Change of temperature
(IEC 60068-2-14:1984 + A1:1986)

Essais d'environnement
Partie 2: Essais - Essai N: Variations
de température
(CEI 60068-2-14:1984 + A1:1986)

Umweltprüfungen
Teil 2: Prüfungen
Prüfung N: Temperaturwechsel
(IEC 60068-2-14:1984 + A1:1986)

This European Standard was approved by CENELEC on 1999-10-01. 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.

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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

The text of the International Standard IEC 60068-2-14:1984 and its amendment 1:1986, prepared by SC 50B (transformed into IEC TC 104 "Environmental conditions, classification and methods of test), was approved by CENELEC as HD 323.2.14 S2 on 1986-09-10.

This Harmonization Document was submitted to the formal vote for conversion into a European Standard and was approved by CENELEC as EN 60068-2-14 on 1999-10-01.

The following date was 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) 2000-10-01

Annexes designated "normative" are part of the body of the standard.

In this standard, annex ZA is normative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60068-2-14:1984 and its amendment 1:1986 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

**Normative references to international publications
with their corresponding European publications**

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).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-1		Environmental testing Part 2: Tests - Tests A: Cold	EN 60068-2-1	
IEC 60068-2-2		Part 2: Tests - Test B: Dry heat	EN 60068-2-2	
IEC 60068-2-33		Part 2: Tests - Guidance on change of temperature tests	EN 60068-2-33	

INTERNATIONAL STANDARD

IEC
60068-2-14

Fifth edition
1984

Basic environmental testing procedures

Part 2: Tests – Test N: Change of temperature

*This **English-language** version is derived from the original **bilingual** publication by leaving out all French-language pages. Missing page numbers correspond to the French-language pages.*



Reference number
IEC 60068-2-14:1984(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

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The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

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Basic environmental testing procedures

Part 2: Tests – Test N: Change of temperature

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

BASIC ENVIRONMENTAL TESTING PROCEDURES

Part 2: Tests — Test N: Change of temperature

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendations and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This standard has been prepared by Sub-Committee 50B: Climatic Tests, of IEC Technical Committee No. 50: Environmental Testing.

A first draft was discussed at the meeting held in The Hague 1982. As a result of this meeting, a draft, Document 50B(Central Office)242, was submitted to the National Committees for approval under the Six Months' Rule in September 1982.

This fifth edition supersedes the fourth edition (1974) of Test N: Change of Temperature.

The National Committees of the following countries voted explicitly in favour of publication:

Australia	Italy
Belgium	Japan
Bulgaria	Korea (Democratic People's Republic of)
Canada	Netherlands
China	New Zealand
Czechoslovakia	Norway
Egypt	Poland
Finland	South Africa (Republic of)
France	Spain
German Democratic Republic	Sweden
Germany	Switzerland
Hungary	Union of Soviet
Israel	Socialist Republics

Other IEC publications quoted in this standard:

Publications Nos.: 68-2-1: Basic Environmental Testing Procedures, Part 2: Tests — Tests A: Cold.

68-2-2: Tests B: Dry Heat.

68-2-33: Guidance on Change of Temperature Tests.

HISTORICAL SURVEY OF TEST N: CHANGE OF TEMPERATURE

- First edition, 1954** Contained one procedure only, Test Na: Rapid change of temperature, two-chamber method.
- Second edition, 1960** Equivalent to the previous Test Na, however, change-over time 2-3 min instead of maximum 5 min.
- Third edition, 1969** *Introduced:*
Test Na — Two-chamber method, equivalent to the previous Test Na, however a test duration of 30 min added as an alternative to 3 h while the temperatures are preferably the upper and lower category temperatures instead of mandatory restrictions to Tests A and B.
Test Nb — One-chamber method.
Test Nc — Two-water-bath method.
- Fourth edition, 1974** *Introduced:*
Test Na — Two-chamber method, equivalent to the previous Test Na, however, some chamber requirements have been added and the testing of heat dissipating specimens covered.
Test Nb — One-chamber method, equivalent to the previous Test Nb, however some chamber requirements have been added and the testing of heat dissipating specimens covered.
Test Nc — Two-water-bath method, no changes.
- Fifth edition, 1984** *Introduces:*
Test Na — Rapid change of temperature with prescribed time of transition, equivalent to the previous test Na, however the transition time is now prescribed more precisely, and a greater number of exposure times are given.
Test Nb — Change of temperature with specified rate of change, equivalent to the previous test Nb, however with a specified rate of change of temperature and a greater number of exposure times are given.

Test Nc — Rapid change of temperature, two fluid-bath method, equivalent to the previous test Nc, however the test is no longer restricted to the use of water and the duration parameters are more strictly described.
-

BASIC ENVIRONMENTAL TESTING PROCEDURES

Part 2: Tests — Test N: Change of temperature

Introduction

A change of temperature test is intended to determine the effect on the specimen of a change of temperature or a succession of changes of temperature.

It is not intended to show effects which are due only to the high or low temperature. For these effects, the dry heat test or the cold test should be used.

The effect of such tests is determined by:

- values of high and low conditioning temperature between which the change is to be effected;
- the conditioning times for which the test specimen is kept at these temperatures;
- the rate of change between these temperatures;
- the number of cycles of conditioning;
- the amount of heat transfer into or from the specimen.

Guidance on the choice of suitable test parameters for inclusion in the detail specification is given in Publication 68-2-33: Basic Environmental Testing Procedures, Part 2: Tests — Guidance on Change of Temperature Tests, which should be read in conjunction with this standard.

1. Test Na: Rapid change of temperature with prescribed time of transition

1.1 Scope

This test determines the ability of components, equipment or other articles to withstand rapid changes of ambient temperature. The exposure times adequate to accomplish this will depend upon the nature of the specimen.

1.2 General description of the test

The specimen is exposed to rapid changes of temperature in air, or in a suitable inert gas, by alternate exposure to low temperature and to high temperature.

1.3 Description of the test apparatus

1.3.1 Testing chamber

- 1.3.1.1 Two separate chambers shall be provided, one for the low temperature and one for the high temperature, the location being such as to allow transfer of the specimen from one chamber to the other within the prescribed time. Either manual or automatic transfer methods may be used.