



IEC 60068-2-14

Edition 7.0 2023-07
REDLINE VERSION

INTERNATIONAL STANDARD



**Environmental testing –
Part 2-14: Tests – Test N: Change of temperature**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 19.040

ISBN 978-2-8322-7338-8

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ENVIRONMENTAL TESTING –

Part 2-14: Tests – Test N: Change of temperature

FOREWORD

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IEC 60068-2-14 has been prepared by IEC technical committee 104: Environmental conditions, classification and methods of test. It is an International Standard.

This seventh edition cancels and replaces the sixth edition published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) updating of the figures for clarification purposes;
- b) updating of specimen temperature(s) and severities as well as tolerances for change of temperature tests;
- c) revision of standardized requirements for test reports for Tests Na and Nb.

The text of this International Standard is based on the following documents:

Draft	Report on voting
104/991/FDIS	104/1016/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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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 that are ~~due only to high or low temperatures~~ caused by low or high temperature exposure. For these effects, the cold test or the dry heat test, as specified in IEC 60068-2-1 and IEC 60068-2-2, should be used.

The effect of ~~such~~ change of temperature tests is determined by

- values of high and low conditioning temperature between which the change is to be ~~effected~~ affected,
- 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,
- the thermal conductivity and the materials of the specimen,
- the rate of change of the specimen's temperature on its surface (respectively in relevant positions) or in its core.

Guidance on the choice of suitable test parameters for inclusion in the detail specification is given throughout this document.

ENVIRONMENTAL TESTING –

Part 2-14: Tests – Test N: Change of temperature

1 Scope

~~This part of IEC 60068 provides a test to determine 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.~~

This document provides tests with specified ambient temperature changes to analyse their impacts on specimens.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

~~IEC 60068 (all parts), *Environmental testing*~~

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

~~IEC 60068-2-17, *Environmental testing – Part 2-17: Tests – Test Q: Sealing*~~

~~IEC Guide 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*~~

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Environmental testing –
Part 2-14: Tests – Test N: Change of temperature**

**Essais d'environnement –
Partie 2-14: Essais – Essai N: Variation de température**

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IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

ESSAIS D'ENVIRONNEMENT –

Partie 2-14: Essais – Essai N: Variation de température

AVANT-PROPOS

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Cette septième édition annule et remplace la sixième édition parue en 2009. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) mise à jour des figures à des fins de clarification;
- b) mise à jour des températures et des sévérités des spécimens, ainsi que des tolérances sur les essais de variation de température;
- c) révision des exigences normalisées pour les rapports d'essai des Essais Na et Nb.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
104/991/FDIS	104/1016/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications.

Une liste de toutes les parties de la série IEC 60068, publiées sous le titre général *Essais d'environnement*, se trouve sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

INTRODUCTION

L'objet d'un essai de variation de température est de déterminer les effets d'une variation de température ou d'une succession de variations de température sur le spécimen.

Il n'a pas pour objet de mettre en évidence les effets causés par une exposition à basse ou à haute température. Dans ce cas, il convient d'utiliser l'essai de froid ou l'essai de chaleur sèche, comme cela est spécifié dans l'IEC 60068-2-1 et l'IEC 60068-2-2 respectivement.

L'effet des essais de variation de température est déterminé par:

- les valeurs respectives des températures d'épreuve haute et basse entre lesquelles doit être effectuée la variation;
- les durées pendant lesquelles le spécimen d'essai est maintenu à ces températures;
- la vitesse de variation entre ces températures;
- le nombre de cycles de l'épreuve;
- la quantité de chaleur transférée par le spécimen vers le milieu ambiant ou inversement;
- la conduction thermique et les matériaux du spécimen;
- la vitesse de variation de la température à la surface du spécimen (respectivement dans les positions adaptées) ou dans son noyau.

Les recommandations pour le choix des paramètres d'essai appropriés à inclure dans la spécification particulière sont données dans l'ensemble du présent document.

ESSAIS D'ENVIRONNEMENT –

Partie 2-14: Essais – Essai N: Variation de température

1 Domaine d'application

Le présent document établit les essais de variations de la température ambiante spécifiée pour analyser leurs impacts sur les spécimens.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60068-2-1, *Essais d'environnement – Partie 2-1: Essais – Essai A: Froid*

IEC 60068-2-2, *Essais d'environnement – Partie 2-2: Essais – Essai B: Chaleur sèche*