

Environmental testing —

Part 2: Tests —

Tests B: Dry heat

The European Standard EN 60068-2-2:1993 has the status of a British Standard
This Part should be read in conjunction with Part 1.1 General and guidance

UDC 621.3:620.193.94-976

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This British Standard, having been prepared under the direction of the General Electrotechnical Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 August 1993

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The following BSI references relate to the work on this standard:
Committee reference GEL/15
Draft for comment 76/26716 DC

ISBN 0 580 22437 6

Amendments issued since publication

Amd. No.	Date	Comments

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National foreword

This British Standard has been prepared under the direction of the General Electrotechnical Standards Policy Committee and is the English language version of EN 60068-2-2:1993 *Basic environmental testing procedures, Part 2: Tests, Tests B: Dry heat* including Amendment A1:1993, published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 68-2-2:1974 including Supplement A:1976 and Amendment 1:1993, published by the International Electrotechnical Commission (IEC). It supersedes BS 2011-2.1B:1977 which is withdrawn.

This edition constitutes a reprint of the 1977 edition of BS 2011-2.1B including Amendment 1:1980 and was published to bring the numbering system of the British Standard into line with the European Standard EN 60068-2-2.

The title of BS EN 60068 has been changed to *Environmental testing* to correspond with the change in title of IEC Publication 68. This change reflects the fact that IEC Publication 68 and BS EN 60068 are concerned with the whole subject of testing and avoids any possible confusion over whether it is the procedures or the testing that are basic. Amendments are not being issued to the other Parts of BS EN 60068, but their titles are being changed when these Parts are reviewed.

For the purposes of this British Standard, any references to IEC page numbers in the text should be ignored.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 26, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Descriptors: Electricity, components, equipment, climatic test, dry heat, sudden change of temperature, gradual change of temperature, loading conditions, procedures, components specifications writing, equipment specifications writing

English version

Basic environmental testing procedures —
Part 2: Tests —
Tests B: Dry heat
(includes amendment A1:1993)

(IEC 68-2-2:1974 + IEC 68-2-2A:1976 + A1:1993)

Essais fondamentaux climatiques et de
robustesse mécanique
Deuxième partie: Essais
Essais B: Chaleur sèche
(inclut l'amendement A1:1993)
(CEI 68-2-2:1974 + CEI 68-2-2A:1976
+ A1:1993)

Umweltprüfungen
Teil 2: Prüfungen
Prüfgruppe B: Trockene Wärme
(enthält Änderung A1:1993)
(IEC 68-2-2:1974 + IEC 68-2-2A:1976
+ A1:1993)

This European Standard was approved by CENELEC on 1992-09-15. 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, 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

The Harmonization Document HD 323.2.2 S1:1988 (IEC 68-2-2:1974 + IEC 68-2-2A:1976) was submitted to the CENELEC voting procedure for conversion into a European Standard.

The text of the International Standard was approved by CENELEC as EN 60068-2-2 on 15 September 1992.

This European Standard supersedes HD 323.2.2 S1:1988.

The following date was fixed:

- latest date of publication of an identical national standard (dop) 1994-01-01

Annexes designated “normative” are part of the body of the standard. In this standard, Annex ZA is normative.

Foreword of EN 60068-2-2:1993/A1: 1993

The text of document 50B(CO) 332, as prepared by sub-committee 50B: Climatic tests, of IEC technical committee 50: Environmental testing, was submitted to the IEC-CENELEC parallel vote in February 1992.

The reference document was approved by CENELEC as amendment A1 to EN 60068-2-2 on 9 December 1992.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-01-01
- latest date of withdrawal of conflicting national standards (dow) 1994-01-01

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Relationship of suffixes between tests A: Cold, and tests B: Dry heat

The relationship of suffixes between Tests A: Cold, and Tests B: Dry heat, is shown in the following table:

Suffix letter	Tests A: Cold			Tests B: Dry heat		
	Specimen type	Temperature change	Specimen temperature at commencement of test duration	Specimen type	Temperature change	Specimen temperature at commencement of test duration
a	non heat	sudden	stabilized ^a	non heat	sudden	stabilized ^a
b	non heat	gradual	stabilized ^a	non heat	gradual	stabilized ^a
c	—	—	—	heat	sudden	stabilized ^a
d	heat	gradual	stabilized ^a	heat	gradual	stabilized ^a
^a The specimens will normally reach temperature stability before commencement of test duration. In exceptional cases, this will not be so, and additional information will be required in the relevant specification. See Clause 1 of the Introduction and IEC Publication 68-3-1. (Amendments to cover these cases are under consideration.)						

Introduction

1 General

This publication deals with dry heat tests applicable both to heat-dissipating and non heat-dissipating specimens. For non heat-dissipating specimens, Tests Ba and Bb do not deviate essentially from earlier issues.

The object of the dry heat test is limited to the determination of the ability of components, equipment or other articles to be used or stored at high temperature.

These dry heat tests do not enable the ability of specimens to withstand or operate during temperature variations to be assessed. In this case, it would be necessary to use Test N: Change of temperature.

The dry heat tests are subdivided as follows:

Dry heat tests for non heat-dissipating specimens

- with sudden change of temperature, Ba;
- with gradual change of temperature, Bb.

Dry heat tests for heat-dissipating specimens

- with sudden change of temperature, Bc;
- with gradual change of temperature, Bd.

The procedures given in this publication are normally intended for specimens which achieve temperature stability during the performance of the test procedure.

The duration of the test commences at the time when temperature stability of the specimen has been reached.

For the exceptional cases when the specimen does not reach temperature stability during the performance of the test procedure, the duration of the test commences at the time when the test chamber reaches the test temperature.

The relevant specification shall define:

- a) the rate of change of temperature in the test chamber;
- b) the time at which the specimens are introduced into the test chamber;
- c) the time at which the exposure commences;
- d) the time at which the specimens are energized.

For these cases, the specification writer will find guidance on choosing the above four parameters in IEC Publication 68-3-1. (Amendments to cover these cases are under consideration.)

2 Application of tests for non heat-dissipating specimens versus tests for heat-dissipating specimens

A specimen is considered heat-dissipating only if the hottest point on its surface, measured in free air conditions (i.e. with no forced air circulation), is more than 5 deg C above the ambient temperature of the surrounding atmosphere after temperature stability has been reached (see IEC Publication 68-1, Sub-clause 4.6).

It is obvious that when the relevant specification calls for a storage test or does not specify an applied load during the test, the Dry Heat Tests Ba and Bb will apply.

3 For non heat-dissipating specimens: Application of tests with sudden change of temperature versus tests with gradual change of temperature

In Test Ba with sudden change of temperature, the specimen is introduced into the test chamber, the latter being at the temperature specified for the test. It has been introduced as a convenient and time-saving method. Test Ba shall be used only when it is known that the effects of a sudden change of temperature are not detrimental to the test specimen.

In Test Bb with gradual change of temperature, the specimen is introduced into the test chamber, the latter being at the laboratory temperature. The temperature in the chamber is then increased gradually so as to cause no detrimental effects on the test specimen due to the temperature change.

4 Testing of heat-dissipating specimens with and without forced air circulation

The preferable method of testing heat-dissipating specimens is that which does not use forced air circulation. If this is impracticable, however, Tests Bc and Bd envisage also procedures for testing heat-dissipating specimens with forced air circulation.

Two methods for testing with air circulation are given (Method A, Method B). Method A applies to the cases where the chamber is large enough to comply with the requirements for testing without forced air circulation, but where the high temperature cannot be maintained without circulating the air in the chamber.

Method B applies to the cases where the chamber is too small to comply with the requirements for testing without forced air circulation.

5 Diagrammatic representations

To facilitate the choice of test method, a diagrammatic representation of the various procedures is given on page 15.

For the convenience of the user of this publication, a complete text without cross-references for each testing procedure is given.

Several clauses are therefore identical, especially in Tests Ba and Bb and in Tests Bc and Bd.

A block diagram showing which clauses are identical and which are different is given on page 16.