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Irish Standard  
I.S. EN 60068-2-38:2009

# Environmental testing -- Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test (IEC 60068-2-38:2009 (EQV))

## I.S. EN 60068-2-38:2009

*Incorporating amendments/corrigenda issued since publication:*

<i>This document replaces:</i> EN 60068-2-38:1999	<i>This document is based on:</i> EN 60068-2-38:2009 EN 60068-2-38:1999	<i>Published:</i> 18 November, 2009 12 May, 2000
This document was published under the authority of the NSAI and comes into effect on:  31 December, 2009		ICS number: 19.04
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**EUROPEAN STANDARD**

**EN 60068-2-38**

**NORME EUROPÉENNE**

**EUROPÄISCHE NORM**

**November 2009**

ICS 19.040

Supersedes EN 60068-2-38:1999

English version

**Environmental testing -  
Part 2-38: Tests -  
Test Z/AD: Composite temperature/humidity cyclic test  
(IEC 60068-2-38:2009)**

Essais d'environnement -  
Partie 2-38: Essais -  
Essai Z/AD: Essai cyclique composite  
de température et d'humidité  
(CEI 60068-2-38:2009)

Umgebungseinflüsse -  
Teil 2-38: Prüfverfahren -  
Prüfung Z/AD: Zusammengesetzte  
Prüfung, Temperatur/Feuchte, zyklisch  
(IEC 60068-2-38:2009)

This European Standard was approved by CENELEC on 2009-09-01. 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.

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**CENELEC**

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: Avenue Marnix 17, B - 1000 Brussels**

**I.S. EN 60068-2-38:2009**

EN 60068-2-38:2009

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**Foreword**

The text of document 104/482/FDIS, future edition 2 of IEC 60068-2-38, prepared by IEC TC 104, Environmental conditions, classification and methods of test, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60068-2-38 on 2009-09-01.

This European Standard supersedes EN 60068-2-38:1999.

The major changes with regard to EN 60068-2-38:1999 concern the updating of the figures, changes to some of the wording and editorial corrections made for clarification.

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) | 2010-06-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn   | (dow) | 2012-09-01 |

Annex ZA has been added by CENELEC.

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**Endorsement notice**

The text of the International Standard IEC 60068-2-38:2009 was approved by CENELEC as a European Standard without any modification.

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## Annex ZA (normative)

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

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.

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 60068-1	- <sup>1)</sup>	Environmental testing - Part 1: General and guidance	EN 60068-1	1994 <sup>2)</sup>
IEC 60068-2-30	- <sup>1)</sup>	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	EN 60068-2-30	2005 <sup>2)</sup>
IEC 60068-2-78	- <sup>1)</sup>	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	2001 <sup>2)</sup>
IEC Guide 104	- <sup>1)</sup>	The preparation of safety publications and the use of basic safety publications and group safety publications	-	-

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<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## ENVIRONMENTAL TESTING –

**Part 2-38: Tests –  
Test Z/AD: Composite temperature/humidity cyclic test**

## FOREWORD

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International Standard IEC 60068-2-38 has been prepared by IEC technical committee 104: Environmental conditions, classification and methods of test.

This second edition cancels and replaces the first edition, published in 1974, and constitutes a technical revision.

The major changes with regard to the previous edition concern the updating of the figures, changes to some of the wording and editorial corrections made for clarification.

The text of this standard is based on the following documents:

FDIS	Report on voting
104/482/FDIS	104/487/RVD

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



This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

It has the status of a basic safety publication in accordance with IEC Guide 104.

A list of all the parts in the IEC 60068 series, under the general title *Environmental testing*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## ENVIRONMENTAL TESTING –

### Part 2-38: Tests –

### Test Z/AD: Composite temperature/humidity cyclic test

## 1 Scope

IEC 60068-2-38 provides a composite test procedure, primarily intended for component type specimens, to determine, in an accelerated manner, the resistance of specimens to the deteriorative effects of high temperature/humidity and cold conditions.

## 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.

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

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

## 3 General

### 3.1 Description of the test

Test Z/AD is a cyclic temperature/humidity test which is designed to reveal defects in test specimens caused by "breathing" as distinct from the absorption of moisture.

This test differs from other cyclic damp heat tests in that it derives its increased severity from:

- a) a greater number of temperature variations or "pumping" actions in a given time;
- b) a greater cyclic temperature range;
- c) a higher cyclic rate of change of temperature;
- d) the inclusion of a number of excursions to sub-zero temperatures.

The accelerated breathing and the effect of the freezing of trapped water in cracks and fissures are the essential features of this composite test.

It is emphasized, however, that the freezing effect will occur only if the fissure dimensions are large enough to allow the penetration of a coherent mass of water as is normally the case in fissures between seals and metal assemblies, or between seals and wire terminations.

The degree of condensation will depend mainly upon the thermal time constant of the surface of the test specimens and may be negligible for very small specimens but copious for large specimens.

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