

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

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60068-2-38:2009 sisaldab Euroopa standardi EN 60068-2-38:2009 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 31.12.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

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Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 60068-2-38:2009 consists of the English text of the European standard EN 60068-2-38:2009.

This standard is ratified with the order of Estonian Centre for Standardisation dated 31.12.2009 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 18.11.2009.

The standard is available from Estonian standardisation organisation.

ICS 19.040

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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.

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: Avenue Marnix 17, B - 1000 Brussels

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.

Endorsement notice

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

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

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

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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.