

INTERNATIONAL STANDARD

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First edition
2004-03

**Semiconductor devices –
Mechanical and climatic test methods –**

**Part 33:
Accelerated moisture resistance –
Unbiased autoclave**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SEMICONDUCTOR DEVICES –
MECHANICAL AND CLIMATIC TEST METHODS –**

**Part 33: Accelerated moisture resistance –
Unbiased autoclave**

FOREWORD

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International Standard IEC 60749-33 has been prepared by IEC technical committee 47: Semiconductor devices.

This standard cancels and replaces IEC/PAS 62172 published in 2000. This first edition constitutes a technical revision.

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

FDIS	Report on voting
47/1737/FDIS	47/1747/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.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

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- withdrawn;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

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SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 33: Accelerated moisture resistance – Unbiased autoclave

1 Scope and object

The unbiased autoclave test is performed to evaluate the moisture resistance integrity of non-hermetic packaged solid-state devices using moisture condensing or moisture saturated steam environments. It is a highly accelerated test which employs conditions of pressure, humidity and temperature under condensing conditions to accelerate moisture penetration through the external protective material (encapsulant or seal) or along the interface between the external protective material and the metallic conductors passing through it. This test is used to identify failure mechanisms internal to the package and is destructive.

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 60749-24, *Semiconductor devices – Mechanical and climatic test methods – Part 24: Accelerated moisture resistance – Unbiased HAST*

3 Test apparatus

The test requires a chamber capable of maintaining a specified temperature and relative humidity under pressure.

3.1 Records

A permanent record of the temperature profile for each test cycle is recommended so that the stress conditions can be verified.

3.2 Devices under stress

Devices under stress shall be no closer than 30 mm from the internal chamber surface and shall not be subjected to direct radiant heat.

3.3 Ionic contamination

Ionic contamination of the test apparatus and storage chamber shall be controlled to avoid test artefacts.

3.4 Distilled or deionized water

Distilled or deionized water with a minimum resistivity of $1 \times 10^4 \Omega\text{m}$ (1 M Ω -cm) (measured at the source) at room temperature shall be used.