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I.S. EN 62137-1-4:2009

# Surface mounting technology - Environmental and endurance test methods for surface mount solder joint -- Part 1-4: Cyclic bending test (IEC 62137-1-4:2009 (EQV))

## I.S. EN 62137-1-4:2009

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EUROPEAN STANDARD  
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EUROPÄISCHE NORM

**EN 62137-1-4**

February 2009

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English version

**Surface mounting technology -  
Environmental and endurance test methods  
for surface mount solder joint -  
Part 1-4: Cyclic bending test  
(IEC 62137-1-4:2009)**

Technologie de montage en surface -  
Méthodes d'essais d'environnement  
et d'endurance des joints brasés  
montés en surface -  
Partie 1-4: Essai de flexion cyclique  
(CEI 62137-1-4:2009)

Oberflächenmontage-Technik -  
Verfahren zur Prüfung  
auf Umgebungseinflüsse  
und zur Prüfung der Haltbarkeit  
von Oberflächen-Lötverbindungen -  
Teil 1-4: Zyklische Biegeprüfung  
(IEC 62137-1-4:2009)

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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 91/815/FDIS, future edition 1 of IEC 62137-1-4, prepared by IEC TC 91, Electronics assembly technology, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62137-1-4 on 2009-02-01.

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) | 2009-11-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn   | (dow) | 2012-02-01 |

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 62137-1-4:2009 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 60194	- <sup>1)</sup>	Printed board design, manufacture and assembly - Terms and definitions	EN 60194	2006 <sup>2)</sup>
IEC 61188-5	Series	Printed boards and printed board assemblies - Design and use - Part 5: Attachment (land/joint) considerations	EN 61188-5	Series
IEC 61190-1-2	- <sup>1)</sup>	Attachment materials for electronic assembly - Part 1-2: Requirements for soldering paste for high-quality interconnects in electronics assembly	EN 61190-1-2	2007 <sup>2)</sup>
IEC 61190-1-3	- <sup>1)</sup>	Attachment materials for electronic assembly - Part 1-3: Requirements for electronic grade solder alloys and fluxed and non-fluxed solid solders for electronic soldering applications	EN 61190-1-3	2007 <sup>2)</sup>
IEC 61249-2-7	- <sup>1)</sup>	Materials for printed boards and other interconnecting structures - Part 2-7: Reinforced base materials, clad and unclad - Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad	EN 61249-2-7 + corr. September	2002 <sup>2)</sup> 2005
IEC 61760-1	- <sup>1)</sup>	Surface mounting technology - Part 1: Standard method for the specification of surface mounting components (SMDs)	EN 61760-1	2006 <sup>2)</sup>

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

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

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Edition 1.0 2009-01

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Surface mounting technology – Environmental and endurance test methods for  
surface mount solder joint –  
Part 1-4: Cyclic bending test**

**Technologie de montage en surface – Méthodes d’essais d’environnement et  
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Partie 1-4: Essai de flexion cyclique**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

# **SURFACE MOUNTING TECHNOLOGY – ENVIRONMENTAL AND ENDURANCE TEST METHODS FOR SURFACE MOUNT SOLDER JOINT –**

## **Part 1-4: Cyclic bending test**

### FOREWORD

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International Standard IEC 62137-1-4 has been prepared by IEC technical committee 91: Electronics assembly technology.

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

FDIS	Report on voting
91/815/FDIS	91/835/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.

A list of all parts of the IEC 62137 series, under the general title *Surface mounting technology – Environmental and endurance test methods for surface mount solder joint*, can be found on the IEC website.

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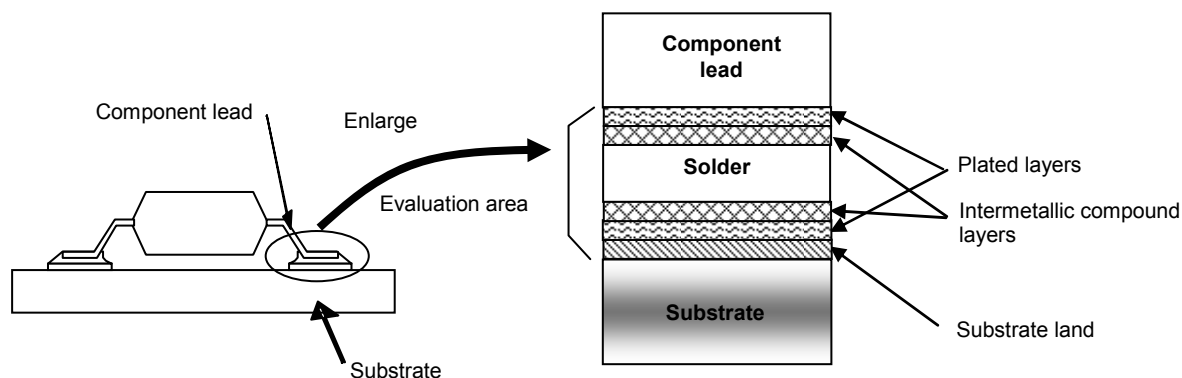
### **Part 1-4: Cyclic bending test**

#### **1 Scope**

The test method described in this part of IEC 62137 applies to surface mount components with a thin and wide basal plane, such as QFP and BGA. This test method evaluates the endurance of the solder joints between component leads and lands on a substrate by cyclic bending of substrate.

This test also evaluates the effects of repeated mechanical stress, such as key pushing in cell phones, the strength of the solder joint between component terminals and lands on a substrate.

In this test method, the evaluation requires first to mount the surface mount component on the substrate by reflow soldering, then cyclically bend the substrate to a certain degree of depth until fracture of the solder joints occurs. The properties of the solder joints (e.g, solder alloy, substrate, mounted device or design, etc.) are evaluated to assist in improving the strength of the solder joints.



IEC 1174/07

**Figure 1 – Image drawing on evaluation area of joint strength**

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