IEC 60512-16-3

Edition 1.0 2008-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Connectors for electronic equipment – Tests and measurements – Part 16-3: Mechanical tests on contacts and terminations – Test 16c: Contact-bending strength

Connecteurs pour équipements électroniques – Essais et mesures – Partie 16-3: Essais mécaniques des contacts et des sorties – Essai 16c: Tenue des contacts au pliage

IEC 60512-16-3:2008

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

- Catalogue of IEC publications: www.iec.ch/searchpub

The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: www.iec.ch/online_news/justpub

Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

- Electropedia: www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: www.iec.ch/webstore/custserv

If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:
Email: csc@iec.ch
Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00

A propos de la CEI

La Commission Electrotechnique Internationale (CEI) est la première organisation mondiale qui élabore et publie des normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

- Catalogue des publications de la CEI: www.iec.ch/searchpub/cur_fut-f.htm

Le Catalogue en-ligne de la CEI vous permet d'effectuer des recherches en utilisant différents critères (numéro de référence, texte, comité d'études,…). Il donne aussi des informations sur les projets et les publications retirées ou remplacées.

- Just Published CEI: www.iec.ch/online_news/justpub

Restez informé sur les nouvelles publications de la CEI. Just Published détaille deux fois par mois les nouvelles publications parues. Disponible en-ligne et aussi par email.

- Electropedia: www.electropedia.org

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International en ligne.

- Service Clients: www.iec.ch/webstore/custserv/custserv_entry-f.htm

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions, visitez le FAQ du Service clients ou contactez-nous:
Email: csc@iec.ch
Tél.: +41 22 919 02 11
Fax: +41 22 919 03 00

IEC 60512-16-3

Edition 1.0 2008-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Connectors for electronic equipment – Tests and measurements – Part 16-3: Mechanical tests on contacts and terminations – Test 16c: Contact-bending strength

Connecteurs pour équipements électroniques – Essais et mesures – Partie 16-3: Essais mécaniques des contacts et des sorties – Essai 16c: Tenue des contacts au pliage

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX

G

ICS 31.220.10

ISBN 2-8318-9879-X

INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONNECTORS FOR ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS –

Part 16-3: Mechanical tests on contacts and terminations – Test 16c: Contact-bending strength

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60512-16-3 has been prepared by subcommittee 48B, Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

This standard cancels and replaces test 16c of IEC 60512-8, issued in 1993. This standard is to be read in conjunction with IEC 60512-1 and IEC 60512-1-100 which explains the structure of the IEC 60512 series.

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

FDIS	Report on voting
48B/1885/FDIS	48B/1918/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 60512 series, under the general title *Connectors for electronic equipment – Tests and measurements*, 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.

CONNECTORS FOR ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS –

Part 16-3: Mechanical tests on contacts and terminations – Test 16c: Contact-bending strength

1 Scope and object

This part of IEC 60512, when required by the detail specification, is used for testing electrical connectors within the scope of technical committee 48. It may also be used for similar devices when specified in a detail specification.

The object of this part of IEC 60512 is to detail a standard test method to determine the ability of a contact to withstand a specified bending moment or force. If so specified in the detail specification, forces other than bending may be applied.

Although this test is illustrated for the mating area of cylindrical contacts, and is particularly applicable to those with a mating diameter of 1,2 mm or less, its use for contacts with other geometries is not excluded. In which case, the detail specification shall contain sufficient detail, given under Clause 6, i), j) and k), to enable the test to be done. Furthermore, it may be used for any part of a connector (such as a keying or polarizing device; cable support or contact latching feature) provided that sufficient detail is given in the detail specification.

NOTE In some cases, IEC 60068-2-21 may be cited in the detail specification.

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 60512-1-1, *Connectors for electronic equipment – Tests and measurements – Part 1-1: General examination – Test 1a: Visual examination*

3 Preparations

3.1 Preparation of specimen

The specimen shall consist of a contact with its terminations, and may be wired if so specified in the detail specification. Any preconditioning given in the detail specification shall be applied.

3.2 Equipment

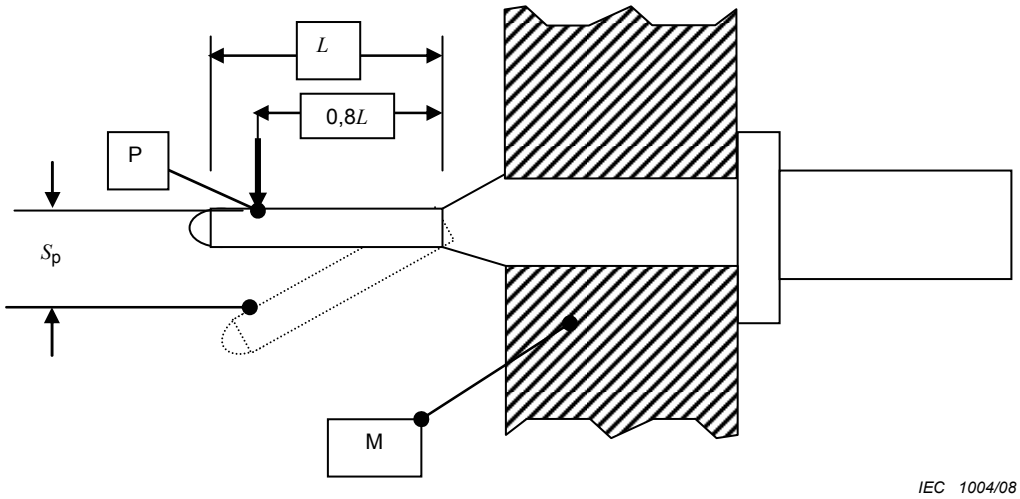
For the application of the specified loads, a suitable device able to provide the controls on the loads (intensity, rate of increase, time of constant load application) shall be required (e.g.: a universal materials testing machine).

If the detail specification requires special preconditioning of the specimen, all the necessary equipment and process steps describing such conditioning shall be included.

4 Mounting

If mounting of the specimen is appropriate, it shall be as specified in the detail specification.

Figure 1 shows an example of mounting and clarifies details to be given in the detail specification.



Key

L	Full engagement length of the contact under test
P	Point and direction of application of force
S_p	Permanent set
M	Mounting or support means

Figure 1 – Contact bending (example)

5 Test method

5.1 General

The specified bending moment or force shall be applied, at a specified rate until the specified value is reached. This shall be maintained for 1 minute. The load shall then be removed. This procedure shall be applied at four points mutually at right angles to each other. For solid (e.g. turned) cylindrical contacts that are axi-symmetrical, only one procedure is necessary. If permanent set, exceeding that allowed, results from the foregoing, a new sample shall be used.

NOTE In the case of asymmetric (stamped and formed) contacts, more procedures should be performed choosing 'worst case' positions.

5.2 Measurements and requirements

5.2.1 Before testing

Visual examination according to IEC 60512-1-1 shall be carried out.

5.2.2 During testing

The deflection and permanent set of the contact, measured at the point of application of that load shall be measured.

NOTE In the case of a contact being made from a highly resilient material (e.g. spring steel or beryllium copper) the deflection may be large whilst the permanent set is negligible.

The permanent set shall not exceed any value(s) given in the detail specification

5.2.3 After testing

Visual examination according to IEC 60512-1-1 shall be carried out.

6 Details to be specified

When this test is required by a detail specification, the following shall be given therein.

a) if preconditioning is required;
b) if the specimen is to be wired, if so details of this;
c) if special mounting of the specimen is required;
d) maximum force to be applied;
e) point of application of force and relationship to mounting or support means;
f) rate application of force;
g) any allowable permanent set;
h) number of specimens to be tested;
i) if IEC 60068-2-21 is to be used;
j) if the geometry of the contact requires special equipment, and if so, details of this;
k) any deviation from the standard test method.

Bibliography

IEC 60068-2-21:2006, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*