INTERNATIONAL STANDARD

IEC 60512-11-14

Second edition
2003-07

Connectors for electronic equipment – Tests and measurements –

Part 11-14: Climatic tests – Test 11p: Flowing single gas corrosion test

Connecteurs pour équipements électroniques – Essais et mesures –

Partie 11-14: Essais climatiques – Essai 11p: Essai de corrosion dans le flux d'un gaz

Reference number
IEC 60512-11-14:2003(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site (www.iec.ch)**

- **Catalogue of IEC publications**

  The on-line catalogue on the IEC web site (www.iec.ch/searchpub) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

- **IEC Just Published**

  This summary of recently issued publications (www.iec.ch/online_news/ justpub) is also available by email. Please contact the Customer Service Centre (see below) for further information.

- **Customer Service Centre**

  If you have any questions regarding this publication or need further assistance, please contact the Customer Service Centre:

  Email: custserv@iec.ch
  Tel: +41 22 919 02 11
  Fax: +41 22 919 03 00

INTERNATIONAL STANDARD

IEC 60512-11-14

Second edition
2003-07

Connectors for electronic equipment – Tests and measurements –

Part 11-14: Climatic tests – Test 11p: Flowing single gas corrosion test

Connecteurs pour équipements électroniques – Essais et mesures –

Partie 11-14: Essais climatiques – Essai 11p: Essai de corrosion dans le flux d'un gaz

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE F

For price, see current catalogue

INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONNECTORS FOR ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS –

Part 11-14: Climatic tests – Test 11p: Flowing single gas corrosion test

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, 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 60512-11-14 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

This second edition cancels and replaces the first edition, published in 1996, of which it constitutes a minor revision to update the normative references.

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/1349/FDIS	48B/1366/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 2006. At this date, the publication will be

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

A bilingual version of this publication may be issued at a later date.

CONNECTORS FOR ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS –

Part 11-14: Climatic tests – Test 11p: Flowing single gas corrosion test

1 Scope and object

This part of IEC 60512, when required by the detail specification, is used for testing of connectors for electronic equipment. This test may also be used for similar components when specified in a detail specification.

The object of this test is to define a standard test method, Test 11p, to assess the effects of controlled corrosion in industrial atmospheres, in a specified concentration of polluted gas(es).

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 60068-2-42:1982, *Environmental testing – Part 2: Tests – Test Kc: Sulphur dioxide test for contacts and connections*

IEC 60068-2-43:1976, *Environmental testing – Part 2: Tests – Test Kd: Hydrogen sulphide test for contacts and connections*

IEC 60068-2-49:1983, *Environmental testing – Part 2: Tests – Guidance to Test Kc: Sulphur dioxide test for contacts and connections*

IEC 60512 (all parts), *Connectors for electronic equipment – Tests and measurements*

IEC 60512-1-100, *Connectors for electronic equipment – Tests and measurements – Part 1-100: General – Applicable publications*

IEC 60721-3-3:1994, *Classification of environmental conditions – Part 3-3: Classification of groups of environmental parameters and their severities – Stationary use at weather-protected locations*

3 Preparation of specimens

The specimen shall be prepared and mounted in accordance with the detail specification.

When required by the detail specification, the specimen shall be operated the number of times specified prior to the test. For each test carried out, the detail specification shall specify the condition and the severity of the component, for example, operated or non-operated, mated or unmated.

NOTE In the case of several specimens, it is recommended to divide the specimens into two groups with different conditions.

4 Method

4.1 Procedure

Test 11p shall be carried out in accordance with

– IEC 60068-2-42, Test Kc: Sulphur dioxide test for contacts and connections;
– IEC 60068-2-43, Test Kd: Hydrogen sulphide test for contacts and connections;
– IEC 60068-2-49, Guidance to Test Kc: Sulphur dioxide test for contacts and connections.

4.2 Severity of the test

The test severity, to be given in the relevant specification, is defined by

– type and concentration of polluting gas;
– temperature;
– relative humidity;
– duration of exposure.

Table 1 – Methods proposed

Method	Polluting gas	Severity 1[a]	Severity 2[b]
A	SO_2	1 max.	10 max. (previous test: Kc)
B	H_2S	0,1 max.	1 max. (previous test: Kd)

NOTE 1 All values in 10^{-6} vol/vol.

NOTE 2 For all methods:

temperature: 25 °C ± 1 °C or 30 °C ± 1 °C

relative humidity: 75 % ± 3 %;

duration: 4, 10, or 21 days.

NOTE 3 Since the nature of aggressivity is different with methods A and B, no comparison between these methods shall be made.

NOTE 4 Other methods may be added in the future after sufficient experience has been gained.

NOTE 5 Condensation on the specimens and on the test equipment shall be avoided.

[a] IEC 60721-3-3, class 3C1.
[b] IEC 60721-3-3, class 3C2.

4.3 Final measurements

Upon completion of the above test, the specimens shall be examined in accordance with the following tests, if applicable:

– test 1a of IEC 60512;
– tests 2a or 2b of IEC 60512;
– test 2c of IEC 60512;
– test 3a of IEC 60512;
– test 4a of IEC 60512;

and with test 13a of IEC 60512, with particular attention to the following details:

a) cracking;
b) delamination;
c) pitting of exposed metal surfaces.

5 Details to be specified

When this test is required by the detail specification, the following details shall be specified:

a) method of preparation and mounting of the specimens;
b) conditioning of the specimens prior to the test (if required);
c) severity, type, concentration and temperature of polluting gas;
d) initial measurements;
e) requirements;
f) duration of exposure;
g) final measurements;
h) any deviation from the standard test method.

Standards Survey

The IEC would like to offer you the best quality standards possible. To make sure that we continue to meet your needs, your feedback is essential. Would you please take a minute to answer the questions overleaf and fax them to us at +41 22 919 03 00 or mail them to the address below. Thank you!

Customer Service Centre (CSC)

International Electrotechnical Commission
3, rue de Varembé
1211 Genève 20
Switzerland

or

Fax to: **IEC**/CSC at +41 22 919 03 00

Thank you for your contribution to the standards-making process.

Nicht frankieren
Ne pas affranchir

Non affrancare
No stamp required

A Prioritaire

RÉPONSE PAYÉE

SUISSE

Customer Service Centre (CSC)
International Electrotechnical Commission
3, rue de Varembé
1211 GENEVA 20
Switzerland

Q1 Please report on **ONE STANDARD** and **ONE STANDARD ONLY**. Enter the exact number of the standard: *(e.g. 60601-1-1)*

.....

Q2 Please tell us in what capacity(ies) you bought the standard *(tick all that apply).* I am the/a:

purchasing agent ❑
librarian ❑
researcher ❑
design engineer ❑
safety engineer ❑
testing engineer ❑
marketing specialist ❑
other.....

Q3 I work for/in/as a: *(tick all that apply)*

manufacturing ❑
consultant ❑
government ❑
test/certification facility ❑
public utility ❑
education ❑
military ❑
other.....

Q4 This standard will be used for: *(tick all that apply)*

general reference ❑
product research ❑
product design/development ❑
specifications ❑
tenders ❑
quality assessment ❑
certification ❑
technical documentation ❑
thesis ❑
manufacturing ❑
other.....

Q5 This standard meets my needs: *(tick one)*

not at all ❑
nearly ❑
fairly well ❑
exactly ❑

Q6 If you ticked NOT AT ALL in Question 5 the reason is: *(tick all that apply)*

standard is out of date ❑
standard is incomplete ❑
standard is too academic ❑
standard is too superficial ❑
title is misleading ❑
I made the wrong choice ❑
other .....

Q7 Please assess the standard in the following categories, using the numbers:
(1) unacceptable,
(2) below average,
(3) average,
(4) above average,
(5) exceptional,
(6) not applicable

timeliness.....
quality of writing.....
technical contents.....
logic of arrangement of contents .....
tables, charts, graphs, figures.....
other .....

Q8 I read/use the: *(tick one)*

French text only ❑
English text only ❑
both English and French texts ❑

Q9 Please share any comment on any aspect of the IEC that you would like us to know:

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

ISBN 2-8318-7143-3

ICS 31.220.10

Typeset and printed by the IEC Central Office
GENEVA, SWITZERLAND