
Preskusne metode za električne materiale, tiskane plošče, povezovalne strukture in sestave – 6. del: Preskusne metode za materiale pri izdelavi elektronskih sestavov (IEC 61189-6:2006)

Test methods for electrical materials, interconnection structures and assemblies - Part 6: Test methods for materials used in manufacturing electronic assemblies (IEC 61189-6:2006)

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**Test methods for electrical materials,
interconnection structures and assemblies
Part 6: Test methods for materials used in
manufacturing electronic assemblies
(IEC 61189-6:2006)**

Méthodes d'essais pour les matériaux
électriques, les structures
d'interconnexion et les ensembles
Partie 6: Méthodes d'essais pour
les matériaux utilisés dans la fabrication
des assemblages électroniques
(CEI 61189-6:2006)

Prüfverfahren für Elektromaterialien,
Verbindungsstrukturen und Baugruppen
Teil 6: Prüfverfahren für Materialien,
die bei der Herstellung elektronischer
Baugruppen eingesetzt werden
(IEC 61189-6:2006)

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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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 91/593/FDIS, future edition 1 of IEC 61189-6, prepared by IEC TC 91, Electronics assembly technology, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61189-6 on 2006-08-01.

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) 2007-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-08-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61189-6:2006 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 | 1988 | Environmental testing Part 1: General and guidance | EN 60068-1 ¹⁾ | 1994 |
| IEC 61189-1 | - ²⁾ | Test methods for electrical materials, interconnection structures and assemblies Part 1: General test methods and methodology | EN 61189-1 | 1997 ³⁾ |
| IEC 61190-1-1 | - ²⁾ | Attachment materials for electronic assembly Part 1-1: Requirements for soldering fluxes for high-quality interconnections in electronics assembly | EN 61190-1-1 | 2002 ³⁾ |
| IEC 61190-1-3 | - ²⁾ | 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 | 2002 ³⁾ |
| ISO 9001 | - ²⁾ | Quality management systems - Requirements | EN ISO 9001 | 2000 ³⁾ |
| ISO 9455 | Series | Soft soldering fluxes - Test methods | EN ISO 9455 | Series |

¹⁾ EN 60068-1 includes corrigendum October 1988 + A1:1992 to IEC 60068-1.

²⁾ Undated reference.

³⁾ Valid edition at date of issue.

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INTERNATIONAL STANDARD

IEC 61189-6

First edition
2006-07

Test methods for electrical materials, interconnection structures and assemblies –

Part 6: Test methods for materials used in manufacturing electronic assemblies

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SIST EN 61189-6:2006

<https://standards.iteh.ai/catalog/standards/sist/9a5bdc4e-b2ab-4e59-a21e-0f2c4bb16985/sist-en-61189-6-2006>

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International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

X

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**TEST METHODS FOR ELECTRICAL MATERIALS,
INTERCONNECTION STRUCTURES AND ASSEMBLIES –**

**Part 6: Test methods for materials used
in manufacturing electronic assemblies**

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.
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International Standard IEC 61189-6 has been prepared by IEC technical committee 91: Electronic assembly technology.

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

| | |
|-------------|------------------|
| FDIS | Report on voting |
| 91/593/FDIS | 91/610/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.

This standard should be used in conjunction with the following parts of IEC 61189, under the main title *Test methods for electrical materials, interconnection structures and assemblies*:

Part 1: General test methods and methodology

Part 2: Test methods for materials for interconnection structures

Part 3: Test methods for interconnection structures (printed boards)

Part 4: Test methods for electronic components assembling characteristics

Part 5: Test methods for printed board assemblies,

and also the following standard:

IEC 60068: Environmental testing

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.

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

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INTRODUCTION

IEC 61189 relates to test methods for printed boards and printed board assemblies, as well as related materials or component robustness, irrespective of their method of manufacture.

The IEC 61189 series is divided into separate parts, covering information for the designer and the test methodology engineer or technician. Each part has a specific focus; methods are grouped according to their application and numbered sequentially as they are developed and released.

In some instances test methods developed by other TCs (e.g. TC 104) have been reproduced from existing IEC standards in order to provide the reader with a comprehensive set of test methods. When this situation occurs, it will be noted on the specific test method; if the test method is reproduced with minor revision, those paragraphs that are different are identified.

This part of IEC 61189 contains test methods for evaluating materials used in manufacturing electronic assemblies. The methods are self-contained, with sufficient detail and description so as to achieve uniformity and reproducibility in the procedures and test methodologies.

The tests shown in this standard are grouped according to the following principles:

P: preparation/conditioning methods

V: visual test methods

D: dimensional test methods

C: chemical test methods

M: mechanical test methods

E: electrical test methods

N: environmental test methods

X: miscellaneous test methods

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To facilitate reference to the tests, to retain consistency of presentation, and to provide for future expansion, each test is identified by a number (assigned sequentially) added to the prefix (group code) letter showing the group to which the test method belongs.

The test method numbers have no significance with respect to an eventual test sequence; that responsibility rests with the relevant specification that calls for the method being performed. The relevant specification, in most instances, also describes pass/fail criterion.

The letter and number combinations are for reference purposes, to be used by the relevant specification. Thus "6C02" represents the chemical test method described in this "Part 6" of IEC 61189. In this example, 6 is the part of IEC standard (61189-6), C is the group of methods, and 02 is the test number.

TEST METHODS FOR ELECTRICAL MATERIALS, INTERCONNECTION STRUCTURES AND ASSEMBLIES –

Part 6: Test methods for materials used in manufacturing electronic assemblies

1 Scope

This part of IEC 61189 is a catalogue of test methods representing methodologies and procedures that can be applied to materials used in manufacturing electronic assemblies.

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 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 61189-1, *Test methods for electrical materials, interconnection structures and assemblies – Part 1: General test methods and methodology*

IEC 61190-1-1, *Attachment materials for electronic assembly – Part 1-1: Requirements for soldering fluxes for high-quality interconnections in electronics assembly*

IEC 61190-1-3, *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*

ISO 9001, *Quality management systems – Requirements*

ISO 9455 (all parts), *Soft soldering fluxes – Test methods*

3 Accuracy, precision and resolution

Errors and uncertainties are inherent in all measurement processes. The information given below enables valid estimates of the amount of error and uncertainty to be taken into account.

Test data serve a number of purposes which include:

- monitoring a process;
- enhancing confidence in quality conformance;
- arbitrating between customer and supplier.

In any of these circumstances, it is essential that confidence can be placed upon the test data in terms of

- accuracy; calibration of the test instruments and/or system,
- precision; the repeatability and uncertainty of the measurement,
- resolution; the suitability of the test instrument and/or system.