IEC 61189-5-1

Edition 1.0 2016-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 5-1: General test methods for materials and assemblies – Guidance for printed board assemblies

Méthodes d'essai pour les matériaux électriques, les cartes imprimées et autres structures d'interconnexion et ensembles – Partie 5-1: Méthodes d'essai générales pour les matériaux et les assemblages – Lignes directrices pour les assemblages de cartes à circuit imprimé

IEC 61189-5-1:2016-07 (en-fr)

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CONTENTS

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TEST METHODS FOR ELECTRICAL MATERIALS, PRINTED BOARDS AND OTHER INTERCONNECTION STRUCTURES AND ASSEMBLIES –

Part 5-1: General test methods for materials and assemblies – Guidance for printed board assemblies

FOREWORD

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International Standard IEC 61189-5-1 has been prepared by IEC technical committee 91: Electronics assembly technology.

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

CDV	Report on voting
91/1273/CDV	91/1354/RVC

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 in the IEC 61189 series, published under the general title *Test methods for electrical materials, printed boards and other interconnection structures and assemblies*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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- withdrawn,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.

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 standard 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 technical committees (for example, 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 revisions, those paragraphs that are different are identified.

This part of IEC 61189 contains test methods for evaluating printed board assemblies as well as materials used in the manufacture of 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.

It was decided by TC 91 that the contents of IEC 61189-5 and IEC 61189-6 be merged into a series of documents in the following way:

IEC 61189-5-1, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 5-1: General test methods for materials and assemblies – Guidance for printed board assemblies*

IEC 61189-5-2:2015, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 5-2: General test methods for materials and assemblies – Soldering flux for printed board assemblies*

IEC 61189-5-3:2015, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 5-3: General test methods for materials and assemblies – Soldering paste for printed board assemblies*

IEC 61189-5-4:2015, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 5-4: General test methods for materials and assemblies – Solder alloys and fluxed and non-fluxed solid wire for printed board assemblies*

IEC 61189-5-501:—, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 5-501: General test methods for materials and assemblies – Surface insulation resistance (SIR) testing of solder fluxes*[1]

IEC 61189-5-502:—, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 5-502: General test methods for materials and assemblies – SIR testing of assemblies* [1]

IEC 61189-5-503:—, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 5-503: General test methods for materials and assemblies – Conductive Anodic Filaments (CAF) testing of circuit* boards [1]

IEC 61189-5-504:—, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 5-504: General test methods for materials and assemblies – Process ionic contamination testing* [1]

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1 Under consideration.

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 including process control tests for the assembly process

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. This responsibility rests with the relevant specification that calls for the method being performed. The relevant specification, in most instances, also describes pass/fail criteria.

The letter and number combinations are for reference purposes to be used by the relevant specification. Thus, "5-2C01" represents the first chemical test method described in IEC 61189-5-2.

In short, in this example, 5-2 is the number of the part of IEC 61189, C is the group of methods, and 01 is the test number.

A list of all test methods included in the above-mentioned documents, is given in Annex A. This annex will be reissued whenever new tests are introduced.

TEST METHODS FOR ELECTRICAL MATERIALS, PRINTED BOARDS AND OTHER INTERCONNECTION STRUCTURES AND ASSEMBLIES –

Part 5-1: General test methods for materials and assemblies – Guidance for printed board assemblies

1 Scope

This part of IEC 61189 is a catalogue of test methods representing methodologies and procedures that can be applied to test printed board assemblies.

This part of IEC 61189 contains the types of content of the IEC 61189-5 series, as well as guidance documents and handbooks for printed board assemblies.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

There are no normative references in this document.

3 Accuracy, precision and resolution

3.1 General

Measurement 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 of a process;
- enhancing the confidence in quality conformance;
- arbitration 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.

3.2 Accuracy

The regime by which routine calibration of the test equipment is undertaken shall be clearly stated in the quality documentation of the supplier or agency conducting the test and shall meet the requirements of ISO 9001 or equivalent (see Bibliography).