BS EN 61189-5-3:2015

BSI Standards Publication

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

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This British Standard is the UK implementation of EN 61189-5-3:2015. It is identical to IEC 61189-5-3:2015. It supersedes BS IEC 61189-5-3:2015, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/501, Electronic Assembly Technology.

A list of organizations represented on this committee can be obtained on request to its secretary.

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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 61189-5-3:2015)

Méthodes d'essai pour les matériaux électriques, les cartes imprimées et autres structures d'interconnexion et ensembles - Partie 5-3: Méthodes d'essai générales pour les matériaux et les assemblages - Pâte de brasage pour les assemblages de cartes imprimées
(IEC 61189-5-3:2015)

Prüfverfahren für Elektromaterialien, Leiterplatten und andere Verbindungsstrukturen und Baugruppen - Teil 5-3: Allgemeine Prüfverfahren für Materialien und Baugruppen - Lotpaste für bestückte Leiterplatten
(IEC 61189-5-3:2015)

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Foreword

The text of document 91/1211/FDIS, future edition 1 of IEC 61189-5-3, prepared by IEC/TC 91 "Electronics assembly technology" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61189-5-3:2015.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2015-11-12
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2018-02-12

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60068-1:2013	NOTE	Harmonized as EN 60068-1:2014 (not modified).
IEC 60068-2-20	NOTE	Harmonized as EN 60068-2-20.
IEC 61189-1	NOTE	Harmonized as EN 61189-1.
IEC 61189-2	NOTE	Harmonized as EN 61189-2.
IEC 61189-3	NOTE	Harmonized as EN 61189-3.
IEC 61190-1-1	NOTE	Harmonized as EN 61190-1-1.
IEC 61249-2-7	NOTE	Harmonized as EN 61249-2-7.
IEC 62137:2004	NOTE	Harmonized as EN 62137:2004 (not modified).
ISO 9001	NOTE	Harmonized as EN ISO 9001.
ISO 9455-2	NOTE	Harmonized as EN ISO 9455-2.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu

Publication	Year	Title	EN/HD	Year
IEC 61189-5	-	Test methods for electrical materials, interconnection structures and assemblies - Part 5: Test methods for printed board assemblies	EN 61189-5	-
IEC 61189-6	-	Test methods for electrical materials, interconnection structures and assemblies - Part 6: Test methods for materials used in manufacturing electronic assemblies	EN 61189-6	-
IEC 61190-1-2	2014	Attachment materials for electronic assembly - Part 1-2: Requirements for soldering pastes for high-quality interconnects in electronics assembly	EN 61190-1-2	2014
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	EN 61190-1-3	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

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International Standard IEC 61189-5-3 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
91/1211/FDIS	91/1224/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 International Standard is used in conjunction with IEC 61189-1:1997, IEC 61189-2:2006, IEC 61189-3:2007.

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 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

IEC 61189 relates to test methods for materials or component robustness for printed board assemblies, 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 TCs (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 revision, those paragraphs that are different are identified.

This part of IEC 61189 contains test methods for evaluating robustness of materials or components for printed board 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

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 criteria.

The letter and number combinations are for reference purposes to be used by the relevant specification. Thus "5-3X01" represents the first chemical test method described in IEC 61189-5-3.

In short, in this example, 5-3 is the number of the part of IEC 61189, X is the group of methods, and 01 is the test number.

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

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 focuses on test methods for soldering paste based on the existing IEC 61189-5 and IEC 61189-6. In addition, it includes test methods of soldering paste for lead free soldering.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61189-5, *Test methods for electrical materials, interconnection structures and assemblies – Part 5: Test methods for printed board assemblies*

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

IEC 61190-1-2:2014, *Attachment materials for electronic assembly – Part 1-2: Requirements for soldering pastes 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*

3 Accuracy, precision and resolution

3.1 General

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 of 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