



NSAI
Standards

Irish Standard
I.S. EN 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

I.S. EN 61189-5-3:2015

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN 61189-5-3:2015

Published:

2015-03-13

This document was published under the authority of the NSAI and comes into effect on:

2015-03-31

ICS number:

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61189-5-3

March 2015

ICS 31.180

English Version

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)

This European Standard was approved by CENELEC on 2015-02-12. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61189-5-3:2015 was approved by CENELEC as a European Standard without any modification.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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	-

This page is intentionally left blank



IEC 61189-5-3

Edition 1.0 2015-01

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

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



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2015 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

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

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

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

IEC Just Published - webstore.iec.ch/justpublished

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

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

More than 60 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) 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 IEC

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

Catalogue IEC - webstore.iec.ch/catalogue

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

Plus de 60 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.



IEC 61189-5-3

Edition 1.0 2015-01

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**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**

**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**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 31.180

ISBN 978-2-8322-1998-0

<p>Warning! Make sure that you obtained this publication from an authorized distributor.</p> <p>Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.</p>
--

CONTENTS

FOREWORD	5
INTRODUCTION	7
1 Scope	8
2 Normative references	8
3 Accuracy, precision and resolution	8
3.1 General	8
3.2 Accuracy	9
3.3 Precision	9
3.4 Resolution	10
3.5 Report	10
3.6 Student's t distribution	10
3.7 Suggested uncertainty limits	11
4 X: Miscellaneous test methods	12
4.1 Test 5-3X01: Paste flux viscosity – T-Bar spindle method	12
4.1.1 Object	12
4.1.2 Test specimen	12
4.1.3 Apparatus and reagents	12
4.1.4 Procedure	12
4.1.5 Safety notes	12
4.2 Test 5-3X02: Spread test, extracted solder flux, paste flux and solder paste	12
4.2.1 Object	12
4.2.2 Method A	13
4.2.3 Method B	14
4.2.4 Additional information	15
4.3 Test 5-3X03: Solder paste viscosity – T-Bar spin spindle method (applicable for 300 Pa·s to 1 600 Pa·s)	15
4.3.1 Object	15
4.3.2 Test specimen	15
4.3.3 Equipment/apparatus	15
4.3.4 Procedure	16
4.3.5 Evaluation	16
4.3.6 Additional information	16
4.4 Test 5-3X04: Solder paste viscosity – T-Bar spindle method (applicable to 300 Pa·s)	16
4.4.1 Object	16
4.4.2 Test specimen	17
4.4.3 Equipment/apparatus	17
4.4.4 Procedure	17
4.4.5 Evaluation	17
4.4.6 Additional information	17
4.5 Test 5-3X05: Solder paste viscosity – Spiral pump method (applicable for 300 Pa·s to 1 600 Pa·s)	18
4.5.1 Object	18
4.5.2 Test specimen	18
4.5.3 Equipment/apparatus	18
4.5.4 Procedure	18

4.5.5	Evaluation	18
4.5.6	Additional information	18
4.6	Test 5-3X06: Solder paste viscosity – Spiral pump method (applicable to 300 Pa·s).....	19
4.6.1	Object.....	19
4.6.2	Test specimen	19
4.6.3	Equipment/apparatus.....	19
4.6.4	Procedure.....	19
4.6.5	Evaluation	19
4.6.6	Additional information	19
4.7	Test 5-3X07: Solder paste – Slump test	20
4.7.1	Object.....	20
4.7.2	Test specimen	20
4.7.3	Equipment/apparatus.....	20
4.7.4	Procedure.....	20
4.7.5	Evaluation	22
4.8	Test 5-3X08: Solder paste – Solder ball test	22
4.8.1	Object.....	22
4.8.2	Test specimen	23
4.8.3	Equipment/apparatus.....	23
4.8.4	Procedure.....	23
4.8.5	Evaluation	24
4.9	Test 5-3X09: Solder paste – Tack test	25
4.9.1	Object.....	25
4.9.2	Method A	25
4.9.3	Method B.....	26
4.9.4	Test equipment sources.....	27
4.10	Test 5-3X10: Solder paste – Wetting test	27
4.10.1	Object.....	27
4.10.2	Test specimen	27
4.10.3	Equipment/materials/apparatus.....	27
4.10.4	Procedure.....	27
4.10.5	Evaluation	28
4.11	Test 5-3X11: Determination of solder powder particle size distribution – Screen method for types 1-4	28
4.11.1	Object.....	28
4.11.2	Test specimen	28
4.11.3	Equipment/apparatus.....	28
4.11.4	Procedure.....	28
4.12	Test 5-3X12: Solder powder particle size distribution – Measuring microscope method.....	30
4.12.1	Object.....	30
4.12.2	Test specimen	30
4.12.3	Equipment/apparatus.....	30
4.12.4	Procedure.....	30
4.13	Test 5-3X13: Solder powder particle size distribution – Optical image analyser method	31
4.13.1	Object.....	31
4.13.2	Test specimen	31
4.13.3	Equipment/apparatus.....	31

4.13.4	Procedure.....	32
4.14	Test 5-3X14: Solder powder particle size distribution – Measuring laser diffraction method	33
4.14.1	Object.....	33
4.14.2	Test specimen	33
4.14.3	Equipment/apparatus.....	33
4.14.4	Preparation.....	34
4.14.5	Test procedure	34
4.14.6	Test	34
4.14.7	Evaluation	34
4.15	Test 5-3X15: Determination of maximum solder powder particle size	35
4.15.1	Object.....	35
4.15.2	Test specimen	35
4.15.3	Evaluation	35
4.16	Test 5-3X16: Solder paste metal content by weight.....	36
4.16.1	Object.....	36
4.16.2	Test specimen	36
4.16.3	Equipment/apparatus.....	36
4.16.4	Procedure.....	36
Annex A (informative) Typical comparison of particle size distributions between laser diffraction method and screen method		38
Bibliography.....		39
Figure 1 – Slump test stencil thickness, 0,20 mm.....		21
Figure 2 – Slump test stencil thickness, 0,10 mm.....		21
Figure 3 – Solder-ball test evaluation.....		24
Figure 4 – Solder wetting examples		28
Figure A.1 – Typical comparison between laser diffraction and sieving		38
Table 1 – Student's t distribution.....		11
Table 2 – Typical spread areas defined in mm ²		13
Table 3 – Example of a test report – Stencil thickness, 0,2 mm.....		22
Table 4 – Example of a test report – Stencil thickness, 0,1 mm.....		22
Table 5 – Screen opening		29
Table 6 – Portions of particle sizes by weight % – nominal values		30
Table 7 – Powder particle size distribution record		30
Table 8 – Powder particle size distribution record		31
Table 9 – Powder particle size distribution record (optical analysis).....		33
Table 10 – Powder particle size distribution record		34
Table 11 – Acceptance of powders by particle sizes		36
Table 12 – Example of a test report on solder paste		37

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

- 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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 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 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

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-