BS EN IEC 61190-1-3:2018

BSI Standards Publication

Attachment materials for electronic assembly

Part 1-3: Requirements for electronic grade solder alloys and fluxed and non-fluxed solid solder for electronic soldering applications (IEC 61190-1-3:2017)

bsi.

National foreword

This British Standard is the UK implementation of EN IEC 61190-1-3:2018. It is identical to IEC 61190-1-3:2017. It supersedes BS EN 61190-1-3:2007+A1:2010, which is withdrawn.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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

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English Version

Attachment materials for electronic assembly - Part 1-3: Requirements for electronic grade solder alloys and fluxed and non-fluxed solid solder for electronic soldering applications (IEC 61190-1-3:2017)

Matériaux de fixation pour les assemblages électroniques - Partie 1-3: Exigences relatives aux alliages à braser de catégorie électronique et brasure solide fluxée et non-fluxée pour les applications de brasage électronique (IEC 61190-1-3:2017)

Verbindungsmaterialien für Baugruppen der Elektronik - Teil 1-3: Anforderungen an Elektroniklote und an Festformlote mit oder ohne Flussmittel für das Löten von Elektronikprodukten (IEC 61190-1-3:2017)

This European Standard was approved by CENELEC on 2018-01-17. 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.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 61190-1-3:2018 E

European foreword

The text of document 91/1468/FDIS, future edition 3 of IEC 61190-1-3, prepared by IEC/TC 91 "Electronics assembly technology" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61190-1-3:2018.

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)	2018-10-17
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2021-01-17

This document supersedes EN 61190-1-3:2017 and EN 61190-1-3:2017/A1:2010.

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

Endorsement notice

The text of the International Standard IEC 61190-1-3:2017 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 61189-5 (series)	NOTE	Harmonized as EN 61189-5 (series).
IEC 61189-6	NOTE	Harmonized as EN 61189-6
ISO 9453	NOTE	Harmonized as EN ISO 9453.
ISO 9454-1	NOTE	Harmonized as EN ISO 9454-1.
ISO 9454-2	NOTE	Harmonized as EN ISO 9454-2.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where 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 60194	2015	Printed board design, manufacture and assembly - Terms and definitions	-	-
IEC 61189-5-2	2015	Test methods for electrical materials, interconnection structures and assemblies - Part 5-2: Test methods for printed board assemblies: Soldering flux	EN 61189-5-2	2015
IEC 61189-5-3	2015	Test methods for electrical materials, interconnection structures and assemblies - Part 5-3: Test methods for printed board assemblies: Soldering paste	EN 61189-5-3	2015
IEC 61189-5-4	2015	Test methods for electrical materials, interconnection structures and assemblies - Part 5-4: Test methods for printed board assemblies: Solder alloys and fluxed and non-fluxed solid wire	EN 61189-5-4	2015
IEC 61190-1-1	2002	Attachment materials for electronic assembly - Part 1-1: Requirements for soldering fluxes for high-quality interconnections in electronics assembly	EN 61190-1-1	2002
IEC 61190-1-2	-	Attachment materials for electronic assembly - Part 1-2: Requirements for soldering pastes for high-quality interconnects in electronics assembly	EN 61190-1-2	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ATTACHMENT MATERIALS FOR ELECTRONIC ASSEMBLY –

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FOREWORD

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International Standard IEC 61190-1-3 has been prepared by IEC technical committee 91: Electronics assembly technology.

This third edition cancels and replaces the second edition, published in 2007 and Amendment 1:2010. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) The maximum impurity level of Pb has been revised and the table of lead free solder alloys includes some additional lead free solder alloys.

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

FDIS	Report on voting
91/1468/FDIS	91/1488/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.

A list of all parts in the IEC 61190 series, under the general title *Attachment materials for electronic assembly*, can be found on the IEC website.

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 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

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

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning particular alloy compositions.

IEC takes no position concerning the evidence, validity and scope of these patent rights.

The holders of these patent rights have assured the IEC that they are willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with IEC. Information may be obtained from:

KR PAT No. 10-0797161
(KR patent application number: KR10-2007-0050905)
KOREA Institute of Industrial technology
89, Yangdaegiro-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si Chungcheongnam-do 331-822 Korea

KR PAT No.10-0445350
Heesung Material LTD.
820-7, Donghang-ri, Yangseong-Myeon,Anseong-Si,Gyeonggi-Do, 456-931, KOREA

JP PAT No.3152945 , and the foreign patents
Nihon Superior
NS Bldg., 1-16-15 Esaka-Cho, Suita City, Osaka, 564-0063, Japan

JP PAT No.3296289, and the foreign patents
Fuji Electronics
Gate City Ohsaki, East tower 11-2, Osaki 1-Chome, Shinagawa-ku, Tokyo, 141-0032, Japan

JP PAT No. 3736819
Toyota Central R&D Labs., Inc.
41-1, Yokomichi, Nagakute, Aichi 480-1192, Japan
Taiho Kogyo Co., Ltd.
3-65 Midorigaoka Toyota-city, Aichi 471-8502, Japan

JP PAT No. 3622788, and the foreign patents
JP PAT No.3753168, and the foreign patents
Senju Metal Industry Co., Ltd.
Senju Hashido-cho 23, Adachi-ku, Tokyo, 120-8555, Japan

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ISO (www.iso.org/patents) and IEC (http://patents.iec.ch) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.

ATTACHMENT MATERIALS FOR ELECTRONIC ASSEMBLY –

Part 1–3: Requirements for electronic grade solder alloys and fluxed and non-fluxed solid solder for electronic soldering applications

1 Scope

This part of IEC 61190 prescribes the requirements and test methods for electronic grade solder alloys, for fluxed and non-fluxed bar, ribbon, powder solders and solder paste, for electronic soldering applications and for "special" electronic grade solders. For the generic specifications of solder alloys and fluxes, see ISO 9453. This document is a quality control document and is not intended to relate directly to the material's performance in the manufacturing process.

Special electronic grade solders include all solders which do not fully comply with the requirements of standard solder alloys and solder materials listed herein. Examples of special solders include anodes, ingots, preforms, bars with hook and eye ends, and multiple-alloy solder powders.

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.

IEC 60194:2015, *Printed board design, manufacture and assembly – Terms and definitions*

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 61190-1-1:2002, *Attachment materials for electronic assembly – Part 1-1: Requirements for soldering fluxes for high-quality interconnections in electronics assembly*

IEC 61190-1-2, *Attachment materials for electronic assembly – Part 1-2: Requirements for soldering pastes for high-quality interconnects in electronics assembly*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60194 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses: