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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
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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

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The holder of this patent right has assured the IEC that he/she is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from:

For Sn96Ag2,5Bi1Cu,5:
US PAT No. 4879096
Cookson Electronics Assembly Materials
600 Route 440 Jersey City, New Jersey 07304

For Sn96,5Ag3Cu,5, Sn95,8Ag3,5Cu,7 and Sn95,5Ag3,8Cu,7:
US PAT No. 5527628
Iowa State University Research Foundation, Inc.
310 Lab of Mechanics
Ames, Iowa 50011-2131, U.S.A.
For Sn88In8Ag3.5Bi,5:
JP PAT No. 3040929
For Sn96.5Ag3Cu,5, Sn95.8Ag3,5Cu,7 and Sn95.5Ag3,8Cu,7:
JP PAT No. 3027441
Matsushita Electric Industrial Co., Ltd.
Matsushita IMP Building 20F 1-3-7, Shiromi, Chouh-ku, Osaka, 540-6319, Japan

For Sn92In4Ag3.5Bi,5
JP PAT No. 2805596
Mitsui Mining & Smelting Co., Ltd.
Gate City Ohsaki-West Tower 19th Fl. 1-11-1 Osaki, Shinagawa-ku, Tokyo, 141-8584, Japan

For Sn96.5Ag3Cu,5, Sn95.8Ag3,5Cu,7, Sn95.5Ag3,8Cu,7 and Sn95.5Ag4.0Cu,5
JP PAT No. 3027441
Senju Metal Industry Co., Ltd.
Senju Hashido-cho 23, Adachi-ku, Tokyo, 120-8555, Japan

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

This second edition cancels and replaces the first edition, published in 2002, and constitutes a technical revision. The main changes with regard to the first edition concern a definition of lead-free solder alloy and an amendment to Table B.1 concerning lead-free solder alloys.

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

<table>
<thead>
<tr>
<th>FDIS</th>
<th>Report on voting</th>
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<tbody>
<tr>
<td>91/647/FDIS</td>
<td>91/679/RVD</td>
</tr>
</tbody>
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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 61190 series, under the general title Attachment materials for electronic assembly, can be found on the IEC website.

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.
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, ISO 9454-1 and ISO 9454-2. This standard 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, multiple-alloy solder powders, etc.

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 60194, Printed board design, manufacture and assembly – Terms and definitions


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

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

ISO 9001, Quality management systems – Requirements

ISO 9453, Soft solder alloys – Chemical compositions and forms

ISO-9454-1:1990, Soft soldering fluxes – Classification and requirements – Part 1: Classification, labelling and packing