

SLOVENSKI STANDARD
SIST EN 61190-1-3:2007**01-oktober-2007****Nadomešča:****SIST EN 61190-1-3:2003**

Povezovalni materiali za elektronske sestave - 1-3. del: Zahteve za spajkalne zlitine ter za spajkalne žice s spajkalno tekočino in brez nje za uporabo v elektroniki (IEC 61190-1-3:2007)

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

[SIST EN 61190-1-3:2007](https://standards.iteh.ai/catalog/standards/sist/9a82ce70-f0bc-46c3-b460-b27a7d0260d6/sist-en-61190-1-3-2007)

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Matériaux de fixation pour les assemblages électroniques -- Partie 1-3: Exigences relatives aux alliages à braser de catégorie électronique et brasures solides fluxées et non-fluxées pour les applications de brasage électronique

Ta slovenski standard je istoveten z: EN 61190-1-3:2007

ICS:

25.160.50	Trdo in mehko lotanje	Brazing and soldering
31.190	Sestavljeni elektronski elementi	Electronic component assemblies

SIST EN 61190-1-3:2007**en,de**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61190-1-3

June 2007

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Supersedes EN 61190-1-3:2002

English version

**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
(IEC 61190-1-3:2007)**

Matériaux de fixation
pour les assemblages électroniques -
Partie 1-3: Exigences relatives
aux alliages à braser de catégorie
électronique et brasures solides
fluxées et non-fluxées pour les
applications de brasage électronique
(CEI 61190-1-3:2007)

Verbindungsmaterialien
für Baugruppen der Elektronik -
Teil 1-3: Anforderungen
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für das Lötten von Elektronikprodukten
(IEC 61190-1-3:2007)

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This European Standard was approved by CENELEC on 2007-05-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 91/647/FDIS, future edition 2 of IEC 61190-1-3, prepared by IEC TC 91, Electronics assembly technology, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61190-1-3 on 2007-05-01.

This European Standard supersedes EN 61190-1-3:2002.

The main changes with regard to EN 61190-1-3:2002 concern a definition of lead-free solder alloy and an amendment to Table B.1 concerning lead-free solder alloys.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2008-02-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-05-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61190-1-3:2007 was approved by CENELEC as a European Standard without any modification. (standards.iteh.ai)

SIST EN 61190-1-3:2007

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60194	- ¹⁾	Printed board design, manufacture and assembly - Terms and definitions	EN 60194	2006 ²⁾
IEC 61189-5	- ¹⁾	Test methods for electrical materials, interconnection structures and assemblies - Part 5: Test methods for printed board assemblies	EN 61189-5	2006 ²⁾
IEC 61189-6	- ¹⁾	Test methods for electrical materials, interconnection structures and assemblies - Part 6: Test methods for materials used in manufacturing electronic assemblies	EN 61189-6	2006 ²⁾
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	- ¹⁾	Attachment materials for electronic assembly - Part 1-2: Requirements for soldering pastes for high-quality interconnects in electronics assembly	EN 61190-1-2	2007 ²⁾
ISO 9001	- ¹⁾	Quality systems - Model for quality assurance in design/ development, production, installation and servicing	EN ISO 9001	2000 ²⁾
ISO 9453	- ¹⁾	Soft solder alloys - Chemical compositions and forms	EN ISO 9453	2006 ²⁾
ISO 9454-1	1990	Soft soldering fluxes - Classification and requirements - Part 1: Classification, labelling and packaging	EN 29454-1	1993
ISO 9454-2	1998	Soft soldering fluxes - Classification and requirements - Part 2: Performance requirements	EN ISO 9454-2	2000

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

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INTERNATIONAL STANDARD

IEC
61190-1-3

Second edition
2007-04

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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b27a7d0260d6/sist-en-61190-1-3-2007](https://standards.iteh.ai/catalog/standards/sist/9a82ce70-f0bc-46c3-b460-b27a7d0260d6/sist-en-61190-1-3-2007)



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International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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.
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The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning in particular alloy compositions. IEC takes no position concerning the evidence, validity and scope of this patent right.

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. 2805595
 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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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. IEC shall not be held responsible for identifying any or all such patent rights.

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:

FDIS	Report on voting
91/647/FDIS	91/679/RVD

<https://standards.iso.org/standards/sist/61190-1-3-2007/91/647/FDIS-91/679/RVD-46c3-1460-b27a7d0260d6/sist-en-61190-1-3-2007>

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.

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

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.

<https://standards.iteh.ai/catalog/standards/sist/9a82ce70-f0bc-46c3-b460-227272727272/sist-en-61190-1-3-2007>
IEC 60194, *Printed board design, manufacture and assembly – Terms and definitions*

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

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*

ISO-9454-2:1998, *Soft soldering fluxes – Classification and requirements – Part 2: Performance requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60194, as well as the following apply. Terms marked with an asterisk (*) are taken from IEC 60194 and are reprinted here for convenience.

3.1**acceptance tests ***

those tests deemed necessary to determine the acceptability of a product and as agreed to by both purchaser and vendor

3.2**alloy**

substance having metallic properties and being composed of two or more chemical elements of which at least one is an elemental metal

3.3**basis metal ***

metal upon which coatings are deposited, also referred to as base metal

3.4**corrosion (chemical/electrolytic) ***

attack of chemicals, flux, and flux residues on base metals

3.5**density (phototool) ***

mass of a surface per unit volume, usually expressed in grams per cubic centimetre

3.6**dewetting ***

condition that results when molten solder coats a surface and then recedes to leave irregularly shaped mounds of solder that are separated by areas that are covered with a thin film of solder and with the basis metal not exposed

3.7**eutectic (n.) ***

alloy having the composition indicated by the eutectic point on an equilibrium diagram or an alloy structure of intermixed solid constituents formed by a eutectic reaction

3.8**eutectic (adj.) ***

isothermal reversible reaction in which, on cooling, a liquid solution is converted into two or more intimately mixed solids, with the number of solids formed being the same as the number of components

3.9**flux ***

chemically - and physically-active compound that, when heated, promotes the wetting of a base metal surface by molten solder by removing minor surface oxidation and other surface films and by protecting the surfaces from reoxidation during a soldering operation

3.10**flux characterization ***

series of tests that determines the basic corrosive and conductive properties of fluxes and flux residues

3.11**flux residue ***

flux-related contaminant that is present on or near the surface of a solder connection

3.12**liquidus**

temperature at which a solder alloy changes from a paste form to a liquid form