



**SLOVENSKI STANDARD**  
**SIST EN 61191-1:2001**  
**01-marec-2001**

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**Printed board assemblies - Part 1: Generic specification - Requirements for soldered electrical and electronic assemblies using surface mount and related assembly technologies**

Printed board assemblies -- Part 1: Generic specification - Requirements for soldered electrical and electronic assemblies using surface mount and related assembly technologies

Elektronikaufbauten auf Leiterplatten -- Teil 1: Fachgrundspezifikation - Anforderungen an gelötete elektrische und elektronische Baugruppen unter Verwendung der Oberflächenmontage und verwandter Montagetechniken

Ensembles de cartes imprimées -- Partie 1: Spécification générique - Exigences relatives aux ensembles électriques ou électroniques brasés utilisant les techniques de montage en surface et associées

**Ta slovenski standard je istoveten z: EN 61191-1:1998**

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**ICS:**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 61191-1

October 1998

ICS 31.240

English version

**Printed board assemblies**  
**Part 1: Generic specification - Requirements for soldered electrical**  
**and electronic assemblies using surface mount**  
**and related assembly technologies**  
**(IEC 61191-1:1998)**

Ensembles de cartes imprimées  
Partie 1: Spécification générique  
Exigences relatives aux ensembles  
électriques ou électroniques brasés  
utilisant les techniques de montage en  
surface et associées  
(CEI 61191-1:1998)

Elektronikaufbauten auf Leiterplatten  
Teil 1: Fachgrundspezifikation  
Anforderungen an gelötete elektrische  
und elektronische Baugruppen unter  
Verwendung der Oberflächenmontage  
und verwandter Montagetechniken  
(IEC 61191-1:1998)

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This European Standard was approved by CENELEC on 1998-10-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and 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 91/131/FDIS, future edition 1 of IEC 61191-1, prepared by IEC TC 91, Surface mounting technology, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61191-1 on 1998-10-01.

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) 1999-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2001-07-01

Annexes designated "normative" are part of the body of the standard.  
Annexes designated "informative" are given for information only.  
In this standard, annexes A, B, C and ZA are normative and annex D is informative.  
Annex ZA has been added by CENELEC.

**Endorsement notice**

The text of the International Standard IEC 61191-1:1998 was approved by CENELEC as a European Standard without any modification.

In the official version, for annex D, Bibliography, the following note has to be added for the standard indicated:

IEC 61189-2

NOTE: Harmonized als EN 61189-2:1997 (not modified).



## Annex ZA (normative)

Normative references to international publications  
with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 60050(541)	1990	International Electrotechnical Vocabulary Chapter 541: Printed circuits	-	-
IEC 60721-3-1 + A1	1987 1991	Classification of environmental conditions Part 3: Classification of groups of environmental parameters and their severities — Section 1: Storage	EN 60721-3-1 <sup>1)</sup>	1993
IEC 61188-1-1	1997	Printed boards and printed board assemblies Design and use Part 1-1: Generic requirements - Flatness considerations for electronic assemblies	EN 61188-1-1	1997
IEC 61188-2	<sup>2)</sup>	Part 2: Guide to the use of printed wiring board substrate materials - Surface mount technology	-	-
IEC 61189-1	1997	Test methods for electrical materials, interconnection structures and assemblies Part 1: General test methods and methodology	EN 61189-1	1997
IEC 61189-3	1997	Part 3: Test methods for interconnection structures (printed boards)	EN 61189-3	1997
IEC 61190-1-1	<sup>2)</sup>	Attachment materials for electronic assemblies Part 1-1: Requirements for soldering fluxes	-	-
IEC 61190-1-2	<sup>2)</sup>	Attachment materials for electronic assemblies Part 1-2: Requirements for soldering pastes	-	-

1) EN 60721-3-1 is superseded by EN 60721-3-1:1997, which is based on IEC 60721-3-1:1997.

2) To be published.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61191-2	1998	Printed board assemblies Part 2: Sectional specification Requirements for surface mount soldered assemblies	-	-
IEC 61191-3	1998	Part 3: Sectional specification Requirements for through-hole mount soldered assemblies	-	-
IEC 61191-4	1998	Part 4: Sectional specification Requirements for terminal soldered assemblies	-	-
IEC 61192-1	- <sup>2)</sup>	Soft soldering Part 1: Assessment of the quality of soldered joints	-	-
IEC 61249-8-1	- <sup>2)</sup>	Materials for interconnection structures Part 8-1: Sectional specification set for non-conductive films and coatings Adhesive coated flexible polyester film	-	-
IEC 61249-8-2	- <sup>2)</sup>	Part 8-2: Sectional specification set for non-conductive films and coatings Adhesive coated flexible polyimide film	-	-
IEC 61249-8-3	- <sup>2)</sup>	Part 8-3: Sectional specification set for non-conductive films and coatings Transfer adhesive film	-	-
IEC 61249-8-8	1997	Part 8: Sectional specification set for non-conductive films and coatings Section 8: Temporary polymer coatings	EN 61249-8-8	1997
IEC 61340-5-1	- <sup>2)</sup>	Electrostatics Part 5-1: Specification for the protection of electronic devices from electrostatic phenomena - General requirements	-	-
IEC 61340-5-2	- <sup>2)</sup>	Part 5-2: Specification for the protection of electronic devices from electrostatic phenomena - User guide	-	-
IEC 61760-2	1998	Surface mounting technology Part 2: Transportation and storage conditions of surface mounting devices (SMD) - Application guide	EN 61760-2	1998
IEC 62326-1	1996	Printed boards Part 1: Generic specification	EN 62326-1	1997

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2) To be published.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC QC 200 012	1996	Process assessment schedule for printed board design facilities	-	-
CECC 100015 <sup>3)</sup>	series	BS - Protection of electrostatic sensitive devices	-	-
ISO 9001	1994	Quality systems - Model for quality assurance in design/ development, production, installation and servicing	-	-
ISO 9002	1994	Quality systems - Model for quality assurance in production, installation and servicing	-	-
ISO 9453	1990	Soft solder alloys - Chemical compositions and forms	-	-
ISO 9454-1	1990	Soft soldering fluxes - Classification and requirements - Part 1: Classification, labelling and packaging	-	-
ISO/DIS 9454-2	- <sup>2)</sup>	Part 2: Performance requirements	-	-

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3) CECC 100015 to be read as EN 100015.

2) To be published.

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**61191-1**

Première édition  
First edition  
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**Ensembles de cartes imprimées –**

**Partie 1:  
Spécification générique –**

**Exigences relatives aux ensembles électriques  
et électroniques brasés utilisant les techniques  
de montage en surface et associées**

SIST EN 61191-1:2001

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**Printed board assemblies –**

**Part 1:  
Generic specification –**

**Requirements for soldered electrical and  
electronic assemblies using surface mount  
and related assembly technologies**

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International Electrotechnical Commission  
Telefax: +41 22 919 0300

3, rue de Varembe Geneva, Switzerland  
e-mail: [inmail@iec.ch](mailto:inmail@iec.ch) IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

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For price, see current catalogue

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## PRINTED BOARD ASSEMBLIES –

## Part 1: Generic specification –

Requirements for soldered electrical and electronic assemblies  
using surface mount and related assembly technologies

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61191-1 has been prepared by IEC technical committee 91: Surface mounting technology.

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

FDIS	Report on voting
91/131/FDIS	91/146/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.

IEC 61191 consists of the following parts, under the general title *Printed board assemblies*

*Part 1: Generic specification – Requirements for soldered electrical and electronic assemblies using surface mount and related assembly technologies*

*Part 2: Sectional specification – Requirements for surface mount soldered assemblies*

*Part 3: Sectional specification – Requirements for through-hole mount soldered assemblies*

*Part 4: Sectional specification – Requirements for terminal soldered assemblies*

Annexes A, B and C form an integral part of this standard.

Annex D is for information only.

## PRINTED BOARD ASSEMBLIES –

### Part 1: Generic specification –

### Requirements for soldered electrical and electronic assemblies using surface mount and related assembly technologies

#### 1 Scope

This specification prescribes requirements for materials, methods and verification criteria for producing quality soldered interconnections and assemblies using surface mounted and related assembly technologies. Also included are recommendations for good manufacturing processes.

#### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61191. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 61191 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

(standards.iteh.ai)

IEC 60050(541):1990, *International Electrotechnical Vocabulary – Chapter 541: Printed circuits*

SIST EN 61191-1:2001

IEC 60721-3-1:1987, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 1: Storage*

IEC 61188-1-1:1997, *Printed boards and printed board assemblies – Design and use – Part 1-1: Generic requirements – Flatness considerations for electronic assemblies*

IEC 61188-2: —, *Design and use requirements of printed boards and printed board assemblies – Part 2: Guide to the use of printed wiring board substrate materials – Surface mount technology*<sup>1)</sup>

IEC 61189-1:1997, *Test methods for electrical materials, interconnection structures and assemblies – Part 1: General test methods and methodology*

IEC 61189-3:1997, *Test methods for electrical materials, interconnection structures and assemblies – Part 3: Test methods for interconnecting structures (printed boards)*

IEC 61190-1-1:—, *Attachment materials for electronic assemblies – Part 1-1: Requirements for soldering fluxes*<sup>1)</sup>

IEC 61190-1-2:—, *Attachment materials for electronic assemblies – Part 1-2: Requirements for soldering pastes*<sup>1)</sup>

<sup>1)</sup> To be published.

- IEC 61191-2:1998, *Printed board assemblies – Part 2: Sectional specification – Requirements for surface mount soldered assemblies*
- IEC 61191-3:1998, *Printed board assemblies – Part 3: Sectional specification – Requirements for through-hole mount soldered assemblies*
- IEC 61191-4:1998, *Printed board assemblies – Part 4: Sectional specification – Requirements for terminal soldered assemblies*
- IEC 61192-1:—, *Soft soldering – Part 1: Assessment of the quality of soldered joints* <sup>1)</sup>
- IEC 61249-8-1:—, *Materials for interconnection structures – Part 8-1: Sectional specification set for non-conductive films and coatings – Adhesive coated flexible polyester film* <sup>1)</sup>
- IEC 61249-8-2:—, *Materials for interconnection structures – Part 8-2: Sectional specification set for non-conductive films and coatings – Adhesive coated flexible polyimide film* <sup>1)</sup>
- IEC 61249-8-3:—, *Materials for interconnection structures – Part 8-3: Sectional specification set for non-conductive films and coatings – Transfer adhesive film* <sup>1)</sup>
- IEC 61249-8-8:1997, *Materials for interconnection structures – Part 8: Sectional specification set for non-conductive films and coatings – Section 8: Temporary polymer coatings*
- IEC 61340-5-1:—, *Electrostatics – Part 5-1: Specification for the protection of electronic devices from electrostatic phenomena – General requirements* <sup>1)</sup>
- IEC 61340-5-2:—, *Electrostatics – Part 5-2: Specification for the protection of electronic devices from electrostatic phenomena – User guide* <sup>1)</sup>
- IEC 61760-2:—, *Surface mounting technology – Part 2: Transportation and storage conditions of surface mounting devices (SMD) – Application guide* <sup>1)</sup>
- IEC 62326-1:1996, *Printed boards – Part 1: Generic specification*
- IEC QC 200 012:1996, *Process assessment schedule for printed board design facilities*
- CECC 100015: BS – *Protection of electrostatic sensitive devices*
- ISO 9001:1994, *Quality systems – Model for quality assurance in design, development, production, installation and servicing*
- ISO 9002:1994, *Quality systems – Model for quality assurance in production, installation and servicing*
- ISO 9453:1990, *Soft solder alloys – Chemical compositions and forms*
- ISO 9454-1:1990, *Soft soldering fluxes – Classification and requirements – Part 1: Classification, labelling and packaging*
- ISO/DIS 9454-2:—, *Soft soldering fluxes – Classification and requirements – Part 2: Performance requirements*

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<sup>1)</sup> To be published.



### 3 Terms and definitions

For the purpose of this part of IEC 61191, the definitions of IEC 60050(541) and the following definitions apply.

#### 3.1

**manufacturer; assembler**

the individual or company responsible for the procurement of materials and components, as well as all assembly process and verification operations necessary to ensure full compliance of assemblies with this specification

#### 3.2

**objective evidence**

documentation, agreed to between user and manufacturer, in the form of hard copy, computer data, computer algorithms, video or other media

#### 3.3

**proficiency**

the capability to perform tasks in accordance with the requirements and verification procedures detailed in this specification

#### 3.4

**supplier**

the individual or company responsible for assuring to the manufacturer (assembler), full compliance of components (electronic, electromechanical, mechanical components, printed boards, etc.) and base materials (solder, flux, cleaning agents, etc.) with the requirements and verification procedures of this specification

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#### 3.5

**user; procuring authority**

the individual, company or agency responsible for the procurement of electrical/electronic hardware, and having the authority to define the class of equipment and any variation or restrictions to the requirements of this specification (i.e., the originator/custodian of the contract detailing these requirements)

#### 3.6

**process deviation indicator (PDI)**

a process deviation indicator is used for continuous process improvement when it is reflective of variation in material, equipment, personnel, process, and/or workmanship. It is not necessarily a defect.

#### 3.7

**bow**

the deviation from flatness of a board characterized by a roughly cylindrical or spherical curvature so that, if the product is rectangular, its four corners are in the same plane

#### 3.8

**twist**

the deviation of a rectangular sheet, panel or printed board that occurs parallel to a diagonal across its surface, so that one of the corners of the sheet is not in the plane that contains the other three corners