

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Workmanship requirements for soldered electronic assemblies –
Part 5: Rework, modification and repair of soldered electronic assemblies**

**Exigences relatives à la qualité d'exécution des assemblages électroniques
brasés –
Partie 5: Retouche, modification et réparation des assemblages électroniques
brasés**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**WORKMANSHIP REQUIREMENTS FOR
SOLDERED ELECTRONIC ASSEMBLIES –****Part 5: Rework, modification and repair of
soldered electronic assemblies**

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International Standard IEC 61192-5 has been prepared by IEC technical committee 91: Electronics assembly technology.

This bilingual version, published in 2008-05, corresponds to the English version.

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

FDIS	Report on voting
91/652/FDIS	91/686/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.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61192 series, under the general title *Workmanship requirements for soldered electronic assemblies*, 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- withdrawn;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.

Withdrawn

WORKMANSHIP REQUIREMENTS FOR SOLDERED ELECTRONIC ASSEMBLIES –

Part 5: Rework, modification and repair of soldered electronic assemblies

1 Scope

This part of IEC 61192 provides information and requirements that are applicable to modification, rework and repair procedures for soldered electronic assemblies. It is applicable to specific processes used to manufacture soldered electronic assemblies where components are attached to printed boards and to the relevant parts of resulting products. The standard is also applicable to activities that can form part of the work in assembling mixed technology products.

This part of IEC 61192 also contains guidance on design matters where they have relevance to rework.

NOTE Typical in-process surface-mount rework activities to which this standard applies are shown in Figure 1.

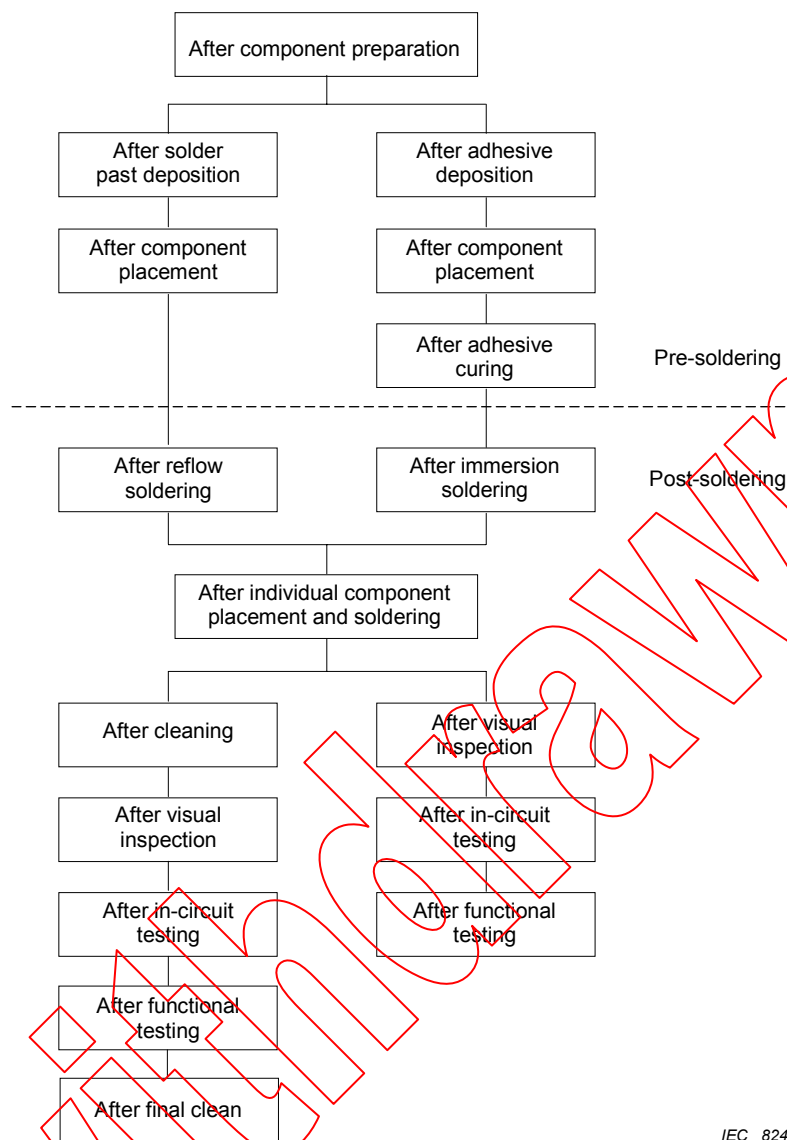


Figure 1 – Typical in-process modification, rework or repair activities

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 (only available in English)*

IEC 61190-1-1, *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 (only available in English)*

IEC 61190-1-3, *Attachment materials for electronics assembly – Part 1-3: Requirements for electronic grade solder alloys and fluxed and non-fluxed solid solders for electronic soldering applications (only available in English)*

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

IEC 61191-2:1998, *Printed board assemblies – Part 2: Sectional specification – Requirements for surface mount soldered assemblies*

IEC 61191-3, *Printed board assemblies – Part 3: Sectional specification – Requirements for through-hole mount soldered assemblies*

IEC 61191-4, *Printed board assemblies – Part 4: Sectional specification – Requirements for terminal soldered assemblies*

IEC 61192-1, *Workmanship requirements for soldered electronic assemblies – Part 1: General*

IEC 61192-2, *Workmanship requirements for soldered electronic assemblies – Part 2: Surface-mount assemblies*

IEC 61192-3, *Workmanship requirements for soldered electronic assemblies – Part 3: Through-hole mount assemblies*

IEC 61192-4, *Workmanship requirements for soldered electronic assemblies – Part 4: Terminal assemblies*

IEC 61193-1, *Quality assessment systems – Part 1: Registration and analysis of defects on printed board assemblies*

IEC 61249 (all parts), *Materials for printed boards and other interconnecting structures*

3 Terminology

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60194, some of which (marked with an asterisk) are repeated below for convenience, as well as the following, apply.

3.1.1

rework*

act of reprocessing non-complying articles, through the use of original or alternate equivalent processing, in a manner that assures compliance of the article with applicable drawings or specifications

3.1.2

repair*

act of restoring the functional capability of a defective article in a manner that precludes compliance of the article with applicable drawings or specifications

3.1.3

modification*

revision of the functional capability of a product in order to satisfy new acceptance criteria

3.1.4

anomaly chart

copy of an assembly drawing (or of an actual printed board assembly) that is used to record the location of faults or process indicators used for process improvement analysis

3.1.5

added component

electronic component that is mounted on a printed board by soldering or other attachment methods

3.1.6

embedded component

electronic component that is an integral part of a printed board, for example, embedded resistors, capacitive layers, printed inductors

3.2 Abbreviations

The following abbreviations are commonly used in relation to printed board assemblies. Not all of them are used in the text. Some are included for information only.

ASIC	application-specific integrated circuit
BGA	ball grid array
CLCC	ceramic leaded chip carrier
CLLCC	ceramic leadless chip carrier
LCCC	leadless ceramic chip carrier
LED	light-emitting diode
MELF	metal electrode face-bonded component
PLCC	plastic leaded chip carrier
PTFE	polytetrafluoroethylene
QFP	plastic quad flat package
RMA	rosin, mildly active
SMD	surface-mounted device
SMT	surface-mount technology
SO	small outline
SOD	small outline diode
SOIC	small outline integrated circuit
SOT	small outline transistor
TSOP	plastic thin small outline package

4 Classification of rework activities

4.1 Pre-soldering rework

This includes rework following:

- component preparation;
- deposition of solder (e.g. paste, preform, tinning);
- deposition of adhesive;
- component placement;