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Test methods for electrical materials, printed boards and other interconnection structures and assemblies -
Part 3-302: Detection of plating defects in unpopulated circuit boards by computed tomography (CT)

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FOREWORD

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IEC 61189-3-302 has been prepared by IEC technical committee 91: Electronics assembly technology. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
91/2060/FDIS	91/2071/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

1 Scope

This part of IEC 61189 describes a method for the detection of plating defects in unpopulated circuit boards using computed tomography (CT).

This document is applicable to non-destructive testing of metallized holes.

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.

ISO 15708-3, *Non-destructive testing - Radiation methods for computed tomography - Part 3: Operation and interpretation*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

– IEC Electropedia: available at https://www.electropedia.org/

– ISO Online browsing platform: available at https://www.iso.org/obp

3.1
imaging resolution
value of the physical size of the detector's pixels divided by the magnification ratio which is the ratio of the distance between the detector and the ray source to the distance between the sample centre and the ray source

4 Test principle

The principle of computer tomography (CT) analysis of the plating defects in the metallization holes of the circuit board consists in using the cone beam X-rays emitted by the X-ray source to obtain multiple X-ray projections from different angles of the sample, with a specific reconstruction algorithm, using the reconstruction software, to reconstruct the three-dimensional structure of the actual sample of the projection image, to display the holes in the sample in grayscale, and obtain the plating defects structure and related numbers. With this method the minimum detectable defect is three times the pixel size of the device's imaging resolution. The typical process is shown in Figure 1.

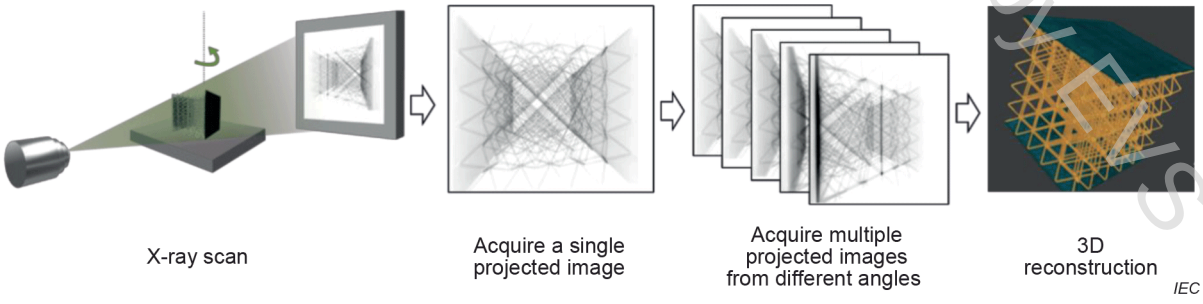

Figure 1 – Typical process of CT analysis