**X-Ray Inspection**

Automated X-ray inspection systems are able to monitor a variety of aspects of a printed circuit board in assembly production.

Inspection is done after the soldering process to monitor defects in soldering quality.

Equipment is able to "see" solder joints that are under packages such as BGAs, CSPs and FLIP chips in which the solder joints are hidden.

This allows verification that the assembly is done corrcetly.

Defects and other information detected by the inspection system can be quickly analysed and the process altered to reduce the defects and improve the quality of the final product.

In this way not only are actual faults detected, but also the process can be altered to reduce the fault levels on the boards coming through. Use of this equipment ensures that the highest standards are maintained in our assembly.

**Components Quality control**

To make sure the components to be used are good quality, there are several processes that we can follow:

1. An overview of the **visual electronic components inspection** process includes:

* **Packaging examined:**
	+ -Weighed and checked for damage
	+ -Taping condition inspected-dented package etc.
	+ -Original factory sealed vs. non-factory sealed
* **Shipping documents verified**
	+ -Country of origin
	+ -Purchase order and sales order numbers match
* **Manufacturer P/N, quantity, date code verification, RoHS**
* **Moisture barrier protection verified (MSL)-vacuum sealed and humidity indicator with specification (HIC)**
* **Products and packaging (photographed and cataloged)**
* **Body marking inspection (faded markings, broken text, double print, ink stamps, etc.)**
* **Physical conditions inspection (lead bands, scratches, chipped edges, etc.)**
* **Any other visual irregularities found**

Once the visual inspection is completed, products are escalated to the next level-electronic components engineering inspection for review.

2. **Engineering Components Inspection**

Trained engineers receive the components for evaluation and inspect them at a microscopic level to ensure consistency and quality.

Any suspect parts or discrepancies that are discovered in the visual inspection process will either be verified or discounted by taking a product sampling of the material/parts.

The **engineering electronic components inspection** process includes:

* Review visual inspection findings and notes
* Purchase and sales orders numbers verified
* Verification of labels (bar codes)
* Manufacturer’s logo and date log verification
* Moisture sensitivity level (MSL) and RoHS status
* Extensive marking permanency tests
* Review and comparison to manufacturer datasheet
* Additional photos taken and catalogued
* Solderibility Testing, the samples undergo an accelerated 'aging ' process before being tested for solderibility, to take into consideration the natural aging effects of storage prior to board- mounting; In addition to the Engineering Components Inspection we have a higher level of inspection under the customer request.

**Other inspection types:**

***1 - Optical Analysis***
Optical inspection for the purpose of illuminated magnifiers and microscopes in the past has been used to date. Cards and better image smaller electronic devices has increased more vibrant and dynamic stereo vision and the high magnification imaging needs.

***2 - Automatic Optical Inspection (AOI) :***

A very busy board with a line of high-capacity SMD can be completed within 15-30 seconds. Very short cycle times in a string of automatic optical inspection log cards must be able to be completed within the same period. An AOI system therefore must be able to keep up with the production line typesetting time and be able to complete all the required inspections quickly.

***3 - Electrical and Functional Testing:***

Electrical testing systems used to catch any errors that may occur in the circuit board at the end of the production line. Optical inspection with a soldering point seems proper; it does not provide information about the value of electrical circuit elements. Of electrical test and functional test methods, it is possible to guarantee the proper functioning of the circuit board. To this end, in-circuit test (in-circuit test) production method using studded with bed bugs and function-testing adapter (MDA or FCT) is made.