



The Product Realization Company

Supplier Requirements For Lead (Pb)-Free Soldering, Area Array (BGA) with only Pb-Free Solder Balls

Plexus Lead-Free Materials Specification # 5504

OVERVIEW

Plexus Materials Specification #5504 requires that all components terminations be compatible with Pb-free solder materials and that all Area Array packages must contain Pb-free solder balls. This allows an assembly to be built with Pb-free soldering materials. All components must also be compatible with the higher re-flow temperatures associated with Pb-free soldering processes.

PLEXUS CORP. RESPONSIBILITIES

It is the responsibility of Plexus Corp. to incorporate Plexus Materials Specification #5504 into all applicable Purchase Order specifications where lead-free solder balls are required on BGA packages attached with Pb-free soldering materials. This specification applies when Plexus will be using a double-sided re-flow Pb-free soldering process, but compliance to RoHS is not required.

SUPPLIER RESPONSIBILITIES

It is the responsibility of all Plexus suppliers to comply with the minimum requirements defined within this specification for all components / assembly materials purchased globally by Plexus under this specification. Any exceptions to this specification need to be approved in writing by Plexus Corp.

PROCESSING REQUIREMENTS FOR SOLDERED COMPONENTS

As component attachment includes processes and reliability requirements for Pb-free soldering materials, the following requirements must be followed for all soldered components:

Logistics

- Changes to existing parts to incorporate a lead-free terminal finish should be published to Plexus per JESD46-B. Any component changes related to the manufacturing process or second level interconnect (final assembly of printed circuit board assembly) compatibility are to be considered a major change.
- Product discontinuances of existing parts should be published to Plexus per JESD48-A .
- All manufacturers who provide notification that they will be producing lead-free/RoHS compliant products should provide a product roadmap to their customers indicating the planned changes and implementation timetable. Availability and life cycle information for both current and lead-free terminal finished products should be specified.
- Sample devices and qualification data should be available to customers prior to the release of the PCN or introduction of the new product.

Compatibility & Testing

- Pb-free second level interconnect compatibility:
 - a) It is the supplier's responsibility to ensure that the first level interconnect, within the component package, and the component construction is compatible with the temperatures associated with Pb-free second level interconnect soldering processes as defined by lead free package classification in IPC/JEDEC J-STD-020 @ the current revision, Table 4-2.
 - b) It is the supplier's responsibility to ensure that all Area Array solder balls have a Pb-free finish.
 - c) It is the supplier's responsibility to ensure that all other components supplied to Plexus are compatible with Pb-free soldering processes.
- Handling, packing, shipping and use executed per IPC J-STD-033 @ the current revision.
- Pass solderability testing per IPC/EIA J-STD-002 @ the current revision. Both no-clean and aqueous clean solder paste and wave solder flux should be included. Solder joint reliability testing (per IPC-A-9701) for both SnPb and SAC alloy solder pastes.
- Mechanical shock and vibration (per AEC-Q100-Rev E/Mil-Std 883).
- High temperature storage (per AEC-Q100-Rev E/JESD22-A103-A).
- Tin whisker growth (Reference current revision of JP002 and JESD201).



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- MSL testing for non-hermetic Solid State Surface Mount Devices:
 - a) Component moisture sensitivity levels (MSL) should not exceed the current levels. Wherever possible, testing should include old vs. new part comparisons. MSL testing should follow IPC/JEDEC J-STD-020 @ the current revision, with the exception that 6 heat cycles for area array packages and 4 heat cycles for other components should be included in pre-conditioning. *(The 6 heat cycle requirement reflects the maximum heat cycles an area array package should encounter)*
 - b) *All Components shall be capable of withstanding at least one rework cycle per J-STD-020 @ the current revision.*

Identification for soldered components

- Device datasheets should clearly indicate the termination metallization, maximum component temperature rating, recommended & absolute reflow profile limits, and the moisture sensitivity rating. If this information is not present on the datasheet, a clear reference stating where it is located should be included.
- Plexus supports the efforts of industry associations and consortia working to provide globally accepted standards for labeling or marking of products. All products that use solder to attach the device/component shall be marked per IPC 1066, "Marking, Symbols and Labels for Identification of Lead-Free and Other Reportable Materials in Lead-Free Assemblies, Components and Devices".