

**Plexus Materials Lead-Free Specification # 5503**

**OVERVIEW**

Plexus Materials Specification #5503 requires that all parts must have Pb-free component terminations. This allows for Pb-free soldering processes including SMT and wave soldering. 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 #5503 into all applicable Purchase Order specifications where lead-free component terminations are required and when the component will be subject to both Pb-free SMT and Pb-free wave soldering, 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 components supplied to Plexus have Pb-free terminal finishes.
- 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).



The Product Realization Company

## Supplier Requirements For Lead (Pb)-Free Soldering, Pb-Free 2<sup>nd</sup> Level Interconnect Terminal Finish of Components

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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".