

1. Purpose

This document defines the requirements that Tecnova Electronics Inc. has placed on their suppliers of raw printed circuit boards (PCBs). This is intended as a supplement to the actual board drawing, with the notes of the drawing/Gerbers taking precedence.

2. Scope

This instruction will cover all certifications, source requirements, material and packaging requirements deemed necessary by Tecnova Electronics.

3. Responsibility

It is the responsibility of the Supplier to ensure that all the following elements are met for all Tecnova Electronic orders. Any issue with these requirements must be addressed with Tecnova Electronics Quality & Supply Chain Management. Any deviations to this document will only be allowed with prior written approved deviation using *Form 734-1 Deviation Request*. Any receipt found not meeting the following requirements will affect the Supplier's rating and may result in a nonconformance.

4. X-Outs

X-Outs are not desired but will be allowed up to 25% of an array. Any further amounts require written deviation approval from Tecnova Electronics Quality & Supply Chain Management. X-Outs must be readily identified with a large "X" across the bad board. Arrays with X-Outs must all be packaged within one package and the label on that package indicating X-Outs contained and the count of good boards.

5. Source

While Tecnova Electronics realizes that some Suppliers use sources overseas (Sub-Tier Suppliers) due to pricing and availability, any outsourcing of the orders must be to recognized PCB manufacturers meeting UL standards and their company found in UL listings. Any move of a part number to a different plant (Sub-Tier Supplier) must be documented & approved by Tecnova Electronics Quality Management using our deviation process. This is to verify any UL specific requirement in the UL file for any product affected and to ensure that all Sub-Tier Suppliers meet the same requirements as our normal suppliers.

6. Certifications

Tecnova Electronics will require the receipt of certifications with each lot that contains the following paperwork:

- a) Certificate of Conformance (C of C) with each order.
- b) RoHS certification.
- c) Inspection Report containing: measurements and microsection readings
- d) Materials used listed or actual copy of material certs.
- e) Electrical Test Report showing completion to drawing requirements if applicable.
- f) Ionic contamination/cleanliness test results.
- g) Flammability rating if applicable.
- h) Any other test results required by the drawing or purchase order.

- i) Date Codes to be listed. If multiple date codes are included within the lot, then each quantity for that date code must be listed.

7. Microsection & Solder Sample Requirements

A standard "AB" coupon will be required on all panels in the production lot per IPC 2221 design. One panel will be selected at random to have an "A" coupon thermal stressed with exposure to six reflow cycles per IPC TM 650 Method 2.6.2. This coupon will be microsectioned, polished and micro etched to be readable for all construction information. This microsection will be sent to Tecnova Electronics to be reviewed and retained with the lot of boards shipped.

Also, a minimum of one solder sample board must be identified and shipped with the shipment to Tecnova Electronics, Inc.

8. Array Gerbers

Whenever a new PCB is procured, array Gerbers must be generated and supplied to Tecnova Electronics. Flow direction should be etched or silk screened into the rails as indicated by Tecnova.

Note: Approval must be received from Tecnova Electronics Engineering stating Gerber's are approved prior to building the PCBs.

9. Packaging

Due to the issue of moisture absorption with board materials, TEI requires that all PCBs be treated as MSL Level 4 per *IPC-J-Std-033 Handling, Packaging, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices*. Unless otherwise specified in the drawing, printed boards shall be dry packed in a heat-sealed moisture barrier bag (MBB), with desiccant and HIC card in accordance with IPC-J-Std-033. The amount of desiccant shall be determined per Appendix B of *IPC-1601A Printed Board Handling and Storage Guidelines*. Other vacuum sealed packaging will be allowed as long as moisture does not penetrate the packaging and the HIC card indicates moisture has not exceeded what is allowed. If multiple date codes exist, the different date codes must be segregated and marked on the packaging so that FIFO may be used and proper traceability is maintained at all times.

Revision History

Date of Issue	Revision	What was changed
1/09/2012	01	New
10/11/2018	02	Updated with Sub-Tier Supplier and Deviation approval to move plants.
4/29/2021	03	New section 7 added for Microsection Requirements
9/13/2022	04	Added to section 4 for X-Outs and a few items updated in certifications required. Section 9 other packaging allowed.