

## SUPPLIER QUALITY

### 1. ELECTRONIC ASSEMBLY WORKMANSHIP REQUIREMENTS:

All items under this Purchase Order shall be manufactured in accordance with, and meet the requirements of, IPC-A-610, Acceptability of Electronic Assemblies, Class 2. If class 3 is required, this will be stated on the Purchase Order as an additional requirement.

This provision flows to all suppliers throughout the procurement chain.

### 2. CABLE WORKMANSHIP REQUIREMENTS:

All items under this Purchase Order shall be manufactured in accordance with, and meet the requirements of, IPC/WHMA-A-620, Requirements and Acceptance for Cable and Wire Harness Assemblies, Class 2. If Class 3 is required, this will be stated on the Purchase Order as an additional requirement.

This provision flows to all suppliers throughout the procurement chain.

Note: If at any time there are questions, concerns, or reasons to deviate, a Problem Statement Form must be filled out and sent to Buyer (Request the PSF form & OI/QUA-012 for details and instructions on the use of the PSF).

### 3. PRINTED CIRCUIT BOARD REQUIREMENTS:

The Seller shall assure and certify that all PCB on the Purchase Order have been manufactured in accordance with the following specifications that apply –

- a) Rigid Class 2 Mil-P-55110, IPC-A-600 and IPC-6012 (latest revision)
- b) Semi Flex Class 2 Mil-P-50884 (latest revision)
- c) Rigid Class 3 IPC-A-600, IPC-6012, IPC-6013 or IPC-RF-245 (latest revision) If Class 3 is required, this will be stated on the print or Purchase Order.

Each multi-layer board shall be 100% net list tested at 250 volts minimum (unless otherwise specified on the print). Compliance is expected with each shipment/lot for recognition and compliance with the standards and print requirements (C of C required with each shipment).

- i. Micro sections must be representative of the board complexity (i.e.: If the board has blind, micro, blind vias, etc. Micro sections representing these areas shall be performed). Test coupons, Solder ability samples, micro section analysis reports and inspection reports shall be stored and retrievable for six years. Cross-Section Sample Plan: The cross-section sample plan shall be to IPC-6012, Table 4-2, C=0 to critical level Class 2 at 1.5 and Class 3 at .10.
- ii. Laser Drilled Plating / PCB Scoring – All laser drilled micro via holes are to be plated shut to within 85%. No score lines are allowed on arrays (unless the print states otherwise).
- iii. Hole plugging material – Must be an epoxy / resin material with a 160Tg, such as SAN-E-PHP-900 or Taiyo THP- 100DH1 or equivalent with Buyer's approval.
- iv. Rework - Rework of copper plating or surface metal finishes such as Enig are not allowed without Buyer's approval.

\*Buyer expects a special C of C referencing the compliance with the following items if the manufacturing date code arriving at the receiving dock is greater than one year. Except White Tin boards the requirement is greater than six months. Date codes for the White Tin coating if different from the etched manufacturing fabrication date code shall take precedence. This is the case with White Tin when the PCB fabrication is pre-made and stored prior to white tin being applied. The manufacturer can stamp the date of the White Tin application to start the six months soldering requirement. However, if the PCB fabrication date code is greater than one year the moisture baking criteria still applies for the PCB fabrication. It is recommended that if this is going to be the case bake prior to the tinning process.

- a) Buyer requires PCB's older than one year from the manufacturing date code to be handled as a moisture sensitive device to level 6 per IPC J-STD-033 with the following modifications (Mandatory bake prior to delivery to Buyer). Section 3.1 table 3-1 requires MSID label - N/A line #2 and #3. Record the bake expiration date on line 4 (the bake expiration shall be 365 days added to the actual date the Seller baked the boards prior to shipment) record the packaging date on the bag Seal Date line. Buyer does not require a caution label or the humidity indicator cards for PCB's.
- b) Buyer requires Solder ability testing and criteria per IPC J- STD-003 to be adhered to when the plating of the PCB's being delivered exceeds 1 year from manufacturing or White Tin exceeds six months (Test and Accept/Reject criteria per A, B, C, D, E & F).

This provision flows to all suppliers throughout the procurement chain.

Note: If at any time there are questions, concerns, or reasons to deviate, a Problem Statement Form must be filled out and sent to Buyer (Request the PSF form & OI/QUA-012 for details and instructions on the use of the PSF).

#### **4. CALIBRATION SERVICES:**

Sellers providing calibration services to Buyer shall have a Quality System compliant with ISO9001 (or equivalent). In addition, such Sellers shall be compliant with ISO/IEC 17025 and ANSI/NCSL Z540-1.

This provision flows to all suppliers throughout the procurement chain.

#### **5. COMPONENT SELLERS / MANUFACTURERS / DISTRIBUTORS:**

This provision flows to all suppliers throughout the procurement chain.

- a) IPC/EIA J-STD-002 Buyer has the right to return components if the manufacturing date code at the time of receipt is beyond the recommended shelf life of that item (typically 18 to 24 months). A Certificate of Compliance stipulating that the solder ability of the components has been performed and passed per IPC/EIA J-STD-002 Test B for leadless, D & S as applicable shall be performed for acceptance beyond the shelf/storage life.
- b) IPC/JEDEC J-STD-033C All moisture sensitive devices must have a label with the MSL Level Number, the Peak Package Body Temperature, and the Bag Seal Date per IPC/JEDEC J-STD-033 labeling requirements.

#### **6. CHEMICAL MANUFACTURERS / SELLERS / DISTRIBUTORS:**

A copy of the Material Safety Data Sheet (MSDS) shall accompany each chemical shipment.

This provision flows to all suppliers throughout the procurement chain.

**7. LIMITED SHELF LIFE MATERIAL:**

Will require the following:

- a) Material identification that matches the purchase order
- b) Identification of manufacturing date and shelf life expiration date on the material label.
- c) Include the Manufacturers' recommended storage temperature and special handling conditions
- d) A minimum of 75% of available shelf life is required for items with shelf life of over 6 months when shipped, and 50% for items with shelf life of 6 months or less. If it is determined that the required shelf life is not available and will cause an unacceptable shortage at Buyer, the Buyer may have the manufacturer/Seller/distributor fill out and submit a Problem Statement Form.

This provision flows to all suppliers throughout the procurement chain.

See - PSF form & OI/QUA-012 for details and instructions on the use of the PSF.