Supplier Quality Requirements

Purpose

- This document provides a standard for workmanship and acceptable quality for materials delivered to Cirtronics.

Order of Precedence

1. Purchase order
2. Drawings and specifications provided
3. This document
4. Applicable industry standards

Contact Cirtronics for clarification should any conflict occur

Terms and Definitions

- Direct Supplier
  - Any supplier who provides materials and/or services with direct impact to product quality.
- Indirect Supplier
  - Any supplier who provides materials and/or services with direct impact to product quality, but with negligible impact to inventory.
- MRO Supplier
  - MRO (Maintenance Repair Operations). Any supplier who provides materials and/or services with no direct impact to product quality.

General Requirements

- All direct suppliers to Cirtronics are expected to meet the following general requirements:

Quality Management System

- Suppliers selected by Cirtronics shall, during the acceptance and performance of all issued Purchase Orders, maintain a Quality Management System acceptable to Cirtronics Corporation. Third party certification to an applicable QMS standard is strongly encouraged. Suppliers will ship product that conforms to the stipulated requirements of said Purchase Order(s) that have been issued. Written approval by Cirtronics Corporation is required before shipment of any non-conforming or potential non-conforming product/material/parts. Suppliers will also include a copy of the deviation documenting the non-conformance with the shipment, if approval was provided to Cirtronics Corporation to ship. Written notification is required within two (2) business days of non-conformance discovery, if determined after shipment.

- Supplier shall notify Cirtronics if applicable certifications or registrations are suspended or revoked (example: ISO 9001, ITAR, etc.)

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Right of Access

- Refer to **W69** Purchase Order Terms & Conditions located on the Cirtronics Website www.cirtronics.com

Code of Ethics

- Cirtronics requires all suppliers to conduct its business fairly, impartially, in an ethical and proper manner, and in full compliance with all applicable laws and regulations. Fairness should be the foundation for all transactions and business dealings. In conducting business, integrity must underline all company relationships. Suppliers may not engage in conduct or activity that may raise questions as to the company's honesty, reputation, nor may they engage in any activity that may create a conflict of interest for themselves or Cirtronics.

Conflict Minerals Policy

- Cirtronics is committed to the pursuit of responsible procurement practices and we encourage our supply chain to source and purchase materials from socially responsible suppliers and refrain from purchasing materials from known conflict sources. For materials procured that may include Conflict Minerals, we request a copy of your conflict minerals sourcing statement(s).

Control of Records

- When applicable, if Cirtronics requires records to be maintained on our behalf at the suppliers' location, please proceed as follows:
    - Records shall be established and maintained that provide evidence of conformity to product or process requirements shall be controlled.
    - The supplier shall have a procedure that defines the controls needed for the identification, storage, protection, retrieval, retention and disposition of controlled records.
    - Unless otherwise specified in contract or purchase order, controlled records pertaining to product quality and manufacturing history shall be retained for **7** years (test reports, inspection reports, investigation reports, nonconformity reports, release documents, work order, shop order travelers, route card, equipment and process qualification, etc). This requirement is still valid even in case of termination of commercial relationships between Supplier and Buyer. If requested, these records need to be provided in a reasonable timeframe.

Control of Work

- The supplier shall notify Cirtronics prior to the temporary or permanent transfer of work to another facility or supplier. The supplier shall ensure the flow-down of the Cirtronics Supplier Quality Requirements and any other requirements called out on the purchase order. The Supplier shall implement a process for periodical monitoring sub-tier suppliers. Monitoring shall be adapted to identify risks and to type of product concerned and including as a minimum:

    - Checking that applicable Buyer requirements are met
    - Measurement of the performance level (quality product and delivery).
    - Note: This requirement is applicable also for mandatory sources specified by the Buyer.

Corrective Actions

- Should any corrective action be issued to a Cirtronics supplier, it is expected that the supplier will take appropriate action to contain and correct the issue, prevent further occurrences, and verify effectivity within 30 days of receiving the corrective action request. If more time is needed, the supplier is expected to contact Cirtronics requesting an extension to the due date.

Counterfeit Part Control

- All component suppliers to Cirtronics shall comply with the applicable standards related to electronics counterfeiting such as, but not restricted to: AS5553, AS6081, AS6496, and AS6171
- Refer to **W69** Purchase Order Terms & Conditions located on the Cirtronics Website www.cirtronics.com .

Equipment/Tools

- All applicable equipment shall be properly maintained to ensure their continued suitability for use.
- All calibrated equipment or tools shall be traceable to NIST or a National Measurement Standard.

Export Control

- All suppliers are expected to comply with the requirements of the Export Administration Regulation (EAR) (15 CFR 730 through 774) and when appropriate the International Traffic of Arms Regulation (ITAR) (22 CFR 120-130) when handling Cirtronics product and documentation.

First Article & Change Control

- When required, suppliers are responsible for initiating a First Article inspection for new fabricated material and when there is a change in the design affecting form, fit, or function of the part (including revision change). Please refer to the “Service Specific Supplier Requirements” section of this document for First Article documentation requirement details.
- Supplier shall notify Cirtronics when there is a significant change which may affect the product such as:
    - A change in manufacturing sources, processes, inspection methods, location(s) of manufacture, tooling or materials that can potentially affect fit, form or function.
    - A change in numerical control program or translation to another media that can potentially affect fit, form or function.
    - A natural or man-made event, which may adversely affect the manufacturing process.
    - When a period of two or more years has lapsed between builds.

Handling, packaging, storage, delivery

- All parts, components, and assemblies shall be handled, packaged, and transported in a manner that provides adequate protection from contamination and damage.
- All limited shelf life materials shall be used in accordance with the manufacturers recommend handling and usage requirements
- Cirtronics prefers that all material shipped not exceed 2 years from date of manufacture. Prior to shipment Cirtronics requires notification if the date of manufacture exceeds 2 years.
- All moisture sensitive materials shall be handled, packaged, and labeled in accordance with IPC/JEDEC-J-STD-033. Any moisture sensitive devices with moisture sensitivity level (MSL) 2-

5a shall be shipped with maximum floor life (unexposed or baked and sealed prior to shipment).
- All ESD sensitive materials shall be handled in an environment that protects them from EOS/ESD damage. Refer to ANSI/ESD 20.20 and related standards.
- Note**:** Inadequate packaging of a shipment to Cirtronics and/or the lack of required documentation shall be cause for rejection of the shipment.

Nonconforming Material
- Written approval by Cirtronics Corporation is required before shipment of any non-conforming or potential non-conforming product/material/parts. This includes nonconforming materials that have been dispositioned as "Repair" or "Use-As-Is".
- Suppliers will also include a copy of the deviation documenting the non-conformance with the shipment, if approval was provided to Cirtronics Corporation to ship. Written notification is required within two (2) business days of non-conformance discovery, if determined after shipment.

Personnel
- The supplier is responsible for ensuring the competency, including any required qualifications and training, of its' employees. Evidence of this training to be documented and available for audit purposes.

Purchase Orders/Contracts
- Purchase orders or contracts will include Cirtronics part number, manufacturer part number (if required), quantity, delivery date, and when applicable, specifications, documentation, special product/process requirements, critical items, key characteristics, work instructions.

Risk Assessment/Mitigation
- Supplier to identify any risks associated with the quote, purchase order, or contract received. Supplier to notify Cirtronics immediately of these risks so that appropriate action can be taken to mitigate or remove the risks.

Supplier Review
- The relationship with our suppliers is important. The parts provided have a direct impact on product quality, safety, conformity, and performance. Based upon the importance of this, Cirtronics will monitor and measure suppliers periodically on the following performance factors:
    - On-time delivery (≥90%)
    - Product/ Service quality (≥98%)

Cirtronics shall maintain this document and make sure all revisions are available to the supply chain. Suppliers are responsible to review and comply with this requirement.

Shipping Documentation Required for Non-Service Specific Suppliers:
- Basic Shipping Documentation to include:
    - A packing slip detailing the Cirtronics PO Number, Cirtronics or Customer Part Number, Manufacturer Part Number, Rev, and Quantity.
    - A certificate of conformity (C of C) (if applicable)
    - Any additional requirements that may be listed on the PO received. (i.e. Lot Control)
    - Refer to next section for **Service Specific Supplier Requirements**/**Documentation.**

Service Specific Supplier Requirements

Cable & Wire Harness Supplier Requirements

- All cable and harness assemblies shall meet the applicable classification requirements of IPC/WHMA-620 and J-STD-001 in addition to any customer requirements including those noted in prints, drawings, and on the purchase order.
- Shipping Documentation:
    - Basic Shipping Documentation to include:
        - A packing slip detailing the Cirtronics PO Number, Cirtronics or Customer Part Number, Rev, and Quantity.
        - Certificate of Compliance to include Cirtronics or Customer Part Number, Rev, Quantity, Test completed, state if assembly is RoHS compliant to latest standard, signed and dated.
        - Any additional requirements that may be listed on the PO received.
    - First Article Documentation to include:
        - Basic Shipping Documentation listed above.
        - First Article Report to include:
        - Test used to verify electrical configuration, note if assembly is RoHS compliant to latest standard, confirm crimp height and pull force is verified during set up, document inspection results to print and confirm components used are per customers BOM. Any deviation to the BOM or drawing needs to be approved prior to building product.
    - Refer to First Article and Change Control Section.

Independent / Broker Component Supplier Requirements

- All component suppliers to Cirtronics shall comply with the applicable standards related to electronics counterfeiting such as, but not restricted to: AS5553, AS6081, AS6496, and AS6171. Refer to “Counterfeit Part Control” section of this agreement.
- Shall have a process ensuring only suitable components are provided.
- There shall be no substitutions to the parts ordered without prior written approval from Cirtronics.
- It is preferred that our independent suppliers are members of IDEA and GIDEP membership encouraged.
- Have an established counterfeit component avoidance program in place that includes full traceability of material sourcing.
- Shipping Documentation:
    - Basic Shipping Documentation to include:
        - A packing slip detailing the Cirtronics PO Number, Cirtronics or Customer Part Number, Manufacturers Part Number, Quantity and date of manufacturer.
        - Provide verification/certification detailing the original source of the material (i.e. manufacturer)
        - Any additional requirements that may be listed on the PO received or on the customer drawing.
    - Refer to First Article and Change Control Section.

PCB Supplier Requirements

- **Any deviation to the BOM or drawing needs to be approved prior to building product.**
- All PCB's shall meet the applicable classification requirements of IPC-6012, IPC-6013, and IPC-A-600 in addition to any customer requirements including those noted in prints, drawings, gerbers, and on the purchase order.
- When the purchase order is placed, an approved panel drawing will be provided or PO will state "one up as is" (per customer fab drawing). If a panel, drawing is part of customer drawing or gerber files use the Cirtronics panel drawing.
- Scrap boards within a panel (X-outs) are not acceptable, unless specifically allowed.
- All boards are to be tested and identified as such, unless specifically allowed.
- Boards should be vacuum packed, sealed, in a moisture barrier bag (MMB)and labeled with the part number, revision, quantity, date code/lot code
    - Packaging shall include desiccant and humidity indicator card (HIC) and be free of damage. Desiccant shall comply with J-STD-033 and be sulfur free
    - Moisture barrier bag should be large enough to allow for multiple opening and resealing
- Records of product cross section, inspection, and test results shall be maintained and readily available. Purchase orders may require solder samples, cross sections, testing results, and certificates of conformity.
- Shipping Documentation:
    - Basic Shipping Documentation to include:
        - A packing slip detailing the Cirtronics PO Number, Cirtronics or Customer Part Number, Rev, and Quantity.
        - Certificates of Conformity must clearly identify if PCB is RoHS compliant to the most current standard, type of surface plating used ie ENIG, OSP, immersion silver, and material used
        - Any additional requirements that may be listed on the PO received.
    - First Article Documentation to include:
        - Basic Shipping Documentation listed above.
        - First Article Report including inspection and test results and material certs.
    - Refer to First Article and Change Control Section.

Programmed Devices Supplier Requirements

- Shipping Documentation:
    - Basic Shipping Documentation to include:
        - A packing slip detailing the Cirtronics PO Number, Cirtronics or Customer Part Number, Rev, and Quantity.
        - A certificate of conformity (C of C).
        - Any additional requirements that may be listed on the PO received.
    - First Article Documentation to include:
        - Basic Shipping Documentation listed above.
        - MPN#, Manufacturer, Master#/Revision and Marking label.
    - Refer to First Article and Change Control Section

Service Specific Supplier Requirements (continued)

Sheet Metal and Plastics Supplier Requirements

- Shipping Documentation:
  - Basic Shipping Documentation to include:
    - A packing slip detailing the Cirtronics PO Number, Cirtronics or Customer Part Number, Rev, and Quantity.
    - A certificate of conformity (C of C)
    - C of C for raw materials
    - Raw materials and Plating Certs
  - First Article Documentation to include (If FA required):
    - Basic Shipping Documentation listed above.
    - First Article Report to include:
      - Inspection results, raw material cert and plating certs, and confirmation material used is per customer BOM /AVL
  - Refer to First Article and Change Control Section.

Test Services Supplier Requirements

- Shipping Documentation to include:
  - A packing slip detailing the Cirtronics PO Number, Part Number, Rev, and Quantity.
  - Test data sheet(s) – test results and serial numbers must be recorded on the test data sheet(s).
  - Any additional requirements that may be listed on the PO received.

BGA Re-Balling Requirements

- Process requirements:
  - Cleaning processes **must** be non-chlorinated.
  - Flux used in the re-balling process **must** be halogen free.
  - Components **must** be post-baked (after re-balling process) per IPC's moisture sensitive device standards, to include but not limited to:
  - IPC-M-109 (most current revision)
  - J-STD-033 (most current revision)
  - IPC handling and storage standards **must** be followed, to include but not limited to:
  - IPC-1601 (most current revision)
- Labeling Requirements:
  - All moisture barrier bags **must** be labeled with identifying numbers provided on the PO.
  - Additional labeling **must** include:
  - Post-bake temperature
  - Post-bake date
  - Total post-bake time
- Packaging requirements:
  - Components **must** be reinstalled into the component tray(s) they were received in.
  - Components **must** be oriented in the tray/carrier in the same orientation in which they were received.
  - Components and tray carriers **must** be packaged and sealed in an ESD, moisture barrier bag that includes an H.I.C. (Humidity Indicator Card) and include the same desiccant received with the components. Any desiccant replacement **must** be of the exact same type, and **must** be new. Used desiccant is **not allowed** as a replacement.

- Documentation requirements:
    - A COC of process activity **is required.**
    - Change control requirements:
    - See Cirtronics document **W59**.

Cirtronics Internal Supporting QMS Documents

C17 Conflict Mineral Policy
C19 Counterfeit Part Control

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