QUALITY ASSURANCE INSPECTION PROCEDURE
FOR
Counterfeit Product Prevention Policy
QAIP-42

PREPARED BY:  John Harper
REVIEWED BY:  Jeff Heller

APPROVALS

<table>
<thead>
<tr>
<th>TITLE</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Control Manager</td>
<td>John Harper</td>
<td>11/8/2013</td>
</tr>
<tr>
<td>Operations Manager</td>
<td>Jeff Heller</td>
<td>11/8/2013</td>
</tr>
<tr>
<td>Purchasing</td>
<td>Jessica Poineer</td>
<td>11/8/2013</td>
</tr>
</tbody>
</table>
1. PURPOSE

To protect Columbia Research Laboratories Incorporate known as CRL throughout this document, our supply chain, and ultimately our customers from the infiltration of counterfeit or questionable pedigree components into our end products.

2. SCOPE

This policy applies to all electronic components and parts delivered to CRL, either in assemblies or as individual components.

CRL suppliers are required to purchase from OCM, OEM, or authorized distributors for such OCM/OEM, as sole and exclusive sources for all Electronic Assemblies, components or parts to be delivered to CRL and to obtain and retain written records for such. Suppliers shall secure a C of C and/or C of CT for all electronic assemblies, components or parts to provide to CRL upon request and maintain on file as described within applicable CRL purchase orders and in compliance with AS9100 and/or ISO9001 requirements.

The use of Non-Authorized Suppliers/Brokers without express written consent by CRL is hereby strictly prohibited.

Note: See paragraph 6 for Process for Use of Non-Authorized Suppliers/Brokers.

3. BACKGROUND

Numerous customers are requiring CRL and our suppliers to implement a counterfeit parts policy with their suppliers and sub-tier suppliers.

4. DEFINITIONS

OCM - Original Component Manufacturers

OEM - Original Equipment Manufacturers

C of C - Certification of Conformance or Certificate of Compliance

C of CT - Certificates of Conformance and acquisition traceability

Authorized/Franchised distributors - Those distributors with which OCM/OEM have contractual agreements identifying them as “Authorized” or in a like manner to buy, stock, re-package, sell, and distribute their product lines.

Non-Authorized Suppliers/Brokers – A Non-Authorized/Franchised distributors, Independent distributors or any organization other than an OCM, OEM or their Authorized/Franchised distributors.
5. SUPPLIER RESPONSIBILITY

All suppliers are required to take the following actions:

1. Implement and enforce a written Counterfeit Parts Prevention and Control Plan designed to preclude, detect, and remove any counterfeit components/parts from all deliveries to CRL.

As an integral part of this plan, the supplier shall maintain a database of counterfeit components/parts received and applicable source data.

2. CRL requires that suppliers review AS5553 and other published or unpublished standards (See “Associated Documents”), for counterfeit component/parts avoidance, detection, migration and disposition, as best practice review and confirm internal procedures are appropriate and effective.

3. Actively cooperate with CRL in the implementation of this policy to eliminate counterfeit components from all products.

4. Ensure this policy and the expected actions are communicated to quality and business leaders throughout your company and your suppliers and their sub-tiers.

6. USE OF NON-AUTHORIZED SUPPLIERS/BROKERS

The use of Non- Authorized suppliers/Brokers without express written consent by CRL is hereby strictly prohibited. Should business reasons (obsolescence, cost, lead time, customer commitments, etc.) dictate the use of such suppliers, the following process is required:

1. Supplier shall notify in writing the Purchasing Representative at CRL of a requirement to utilize a non-authorized source.

2. Supplier shall provide specific details regarding the suggested source, the known details on component pedigree, date code, and use of this suggested verification/test plan for component Verification.

   2A. Electronic parts not available through a OCM, OEM or authorized distributors for such OCM/OEM may be procured from a Broker without C of CT only after CRL approval and Component authenticity verification per Component Verification section And Testing/Analysis Table.
   - Broker shall have an active counterfeit part detection program. CRL may review relevant databases (ERAI, GIDEP) to evaluate broker’s history of supplying counterfeit components prior to approval.
   - Suppliers shall notify the appropriate CRL buyer to request Design activity for component replacement or circuit board re-design.

3. Supplier shall provide all details in writing on a supplier request form document which includes a customer sign off and approval section.
4. CRL shall review the supplier request and will either approve, reject, or return with comments of requested changes including but not limited to additional or alternative verification requirements. Visual inspection, part marking inspection, and C of C inspection shall be included as critical verification steps in all such instances.

5. Should CRL provide approval, the supplier shall provide Certification of Conformance, verification documentation, and any test results promptly to CRL.

6. Supplier is not approved to deliver product(s) to CRL until signed approval is provided and certification of conformance and test results are provided and confirmed to be compliant to the details agreed upon in the approved supplier request form.

Component Verification
All inspection and testing shall be performed to the original manufacturer’s specifications and Parameters Steps A, B, C, D, E, and F should be performed in order. If nonconformance is found, stop testing, reject the lot, and notify the CRL buyer. Testing shall only be performed by test house pre-approved by CRL Supplier Quality Engineer.

A: Visual Inspection
Each lot to be delivered shall be subjected to a visual inspection at an AQL of 1.0 or tighter with a 40x minimum magnification. 100% of the remaining lot shall be visually inspected without Magnification Visual inspection shall include but is not limited to: verifying lot/date codes against Manufacturer’s database, correct English spelling, manufacturer’s logo, evidence of component Remarking, damaged bent leads, chip-outs, scratches, cracks, terminal finish inconsistent with Manufacturer’s specification for that part number, any discrepancies to the pin one indicating area, and inconsistencies between the upper and lower mold of the component.

B: Authenticity Verification
Each lot to be delivered shall be subjected to an inspection at an AQL of 1.0 or tighter. Testing shall include verification of the components physical attributes to the original manufacturer’s drawing, Swabbing and other applicable testing to verify authenticity. Swabbing shall be performed to the Current revision of MIL-STD-883 testing method 2015 using acetone and the alcohol and mineral Spirits solution.

C: X-ray Inspection
Each lot to be delivered shall be subjected to an inspection at an AQL of 1.0 or tighter. X-ray inspection shall include checking for the presence of the die, cracks in the epoxy, checking wire Bonds, product or manufacturing markings that are X-ray detectable and any mixed die Configurations within the same lot/date code.

D: Electrical Testing
Electrical testing of each lot to be delivered shall be completed at an AQL of 1.0 or tighter. Testing shall include verifying electrical specifications from the original manufacturer’s technical data sheets As approved by CRL. Testing must be performed at thermal temperatures as identified on the OEM/OCM specification.

E: Destructive Physical Analysis
Each lot to be delivered shall be subjected to a DPA inspection of 2% to a maximum of 30 units per Lot code. Inspection shall include verification of authenticity of the die and any other internal features that may be shown on the original manufacturer’s technical data.

F: Plating Inspection
Each lot shall be verified for lead finish per manufacturer’s specification using appropriate Methodology such as X-Ray Fluorescence.
<table>
<thead>
<tr>
<th>Component Type</th>
<th>Plating Inspection (F)</th>
<th>Visual Inspection (A)</th>
<th>Authenticity Verification (B)</th>
<th>X-ray Inspection (C)</th>
<th>Electrical Testing (D)</th>
<th>Destructive Physical Analysis (DPA) (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacitors</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connectors</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crystals</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Diodes</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuses</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Heat sinks</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inductors</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LED</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mechanical parts</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potentiometer</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relays</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Resistors</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Speakers</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switches</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformers</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transistors</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Disposition and Reporting of Counterfeit Parts

#### Disposition and Segregation

Nonconforming parts shall be disposition and segregated per this document. Confirmed counterfeit parts shall be prevented from re-entering the supply chain. Reporting all occurrences of counterfeit parts shall be documented and reported, as appropriate, through CRL Purchasing and when possible to External Organizations such as: (ERAI, GIDEP law enforcement agencies). Membership and reporting through ERAI (ELECTRONICS RETAILERS ASSOCIATION INTERNATIONAL) and/or GIDEP (GOVERNMENT - INDUSTRY DATA EXCHANGE PROGRAM) organizations is strongly encouraged.

Find ERAI web site at: [http://www.erai.com/](http://www.erai.com/)
Find GIDEP web site at: [http://www.gidep.org/](http://www.gidep.org/)

#### Liability

Suppliers shall be held liable for any counterfeit parts entering CRL supply chain up to and including all costs incurred by CRL resulting from the counterfeit parts.

### 7. INTERPRETATION

The CRL Quality Management or Purchasing Representative can be contacted for further interpretation or clarification of this policy.
8 ASSOCIATED DOCUMENTS

Documentation (supporting quality records) retention is subject to all AS9100 or customer specific requirements, whichever is greater.

Columbia's Reference Documents:

CRL Quality Systems Manual AS9100
CRL Quality Control Procedure QC-10; (Purchasing and Supplier Control)
CRL Form 111; (Terms and Conditions of Purchase)

Standards Reference Documents: Published or Unpublished

AS5553 - Counterfeit Electronic Parts; Avoidance, Detection, Mitigation and Disposition
AS6081 - Counterfeit Electronic Parts; Avoidance Protocol, Distributors
AS6174 - Counterfeit Material; Detection, Mitigation and Disposition
AS9100 - Aerospace Quality Management Standard
AS9120 - Quality Management Standard; Requirements for Aviation’s, Space and Defense Distributors
ARD6884 - Terms and Definition; Fraudulent/Counterfeit Electronic Parts
ARP6178 - Fraudulent/Counterfeit Electronic Parts; Tools for Risk Assessment of Distributors
ISO9001 - Quality Management Standard