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| Document Title: | Procedure, Quality Requirements for Production Material |
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| | Name | Date |
|-----------------------|--------------------|-------------|
| Process Owner: | Stephen Montgomery | 10/27/2008 |
| Quality: | Stephen Montgomery | 10/27/2008 |

| Rev | ECN | Description | Incorporated By | Date |
|------------|------------|---|------------------------|-------------|
| A | 1495 | INITIAL RELEASE | D. McSloy | 05/02/2002 |
| B | 11343 | Added coversheet and instructions | S. Montgomery | 10/27/2008 |
| C | 11397 | Added sections 4 and 5; updated Q2, Q3, Q5, Q6 and Q7 | S. Montgomery | 01/22/2009 |
| D | 11694 | Added clauses Q30 through Q34, Revised Q2, Q3, Q14 and Q-27, corrected footer, added Q31 – Q 34 to commodities, added Q30 to PCBA commodity | S. Montgomery | 05/08/2012 |
| E | 11695 | Added clause Q35 (Nadcap) | S. Montgomery | 05/17/2012 |
| F | 11709 | Modified Q-clauses Q15, Q27 and Q29. Moved Q30 from PWB to PCBA requirements | S. Montgomery | 08/01/2012 |
| G | 11738 | Update to Q27 on length of time that a FAI is valid; added “part number revision” to Q11 | S. McHenry | 11/01/2012 |
| H | 11834 | Update Q29 and Q6. Update typical requirements for 5.2 and 5.4. General edit and cleanup of document | S. Montgomery | 12/13/2013 |
| J | 11968 | Update Q30, and add Q37; revise para 5.2 and add para 5.8 | S. Montgomery | 03/11/2015 |
| K | 12012 | Added Q38 for use when DFAR 252.246-7007 is invoked on an Areté contract | S. McHenry | 05/27/15 |
| L | 12204 | Added Q39, Q40 and added Q-clause examples tooling, labels, o-ring/seals and updated Q12 | S. Montgomery | 07/28/16 |
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1. Scope

This document defines the process for attaching Quality Requirements to production materials. Quality Assurance is responsible for the implementation of this procedure.

2. Procedure

2.1. Quality Clause Assignment

2.1.1. Quality clauses will be attached as standard text in the parts management data base system. It is the responsibility of Quality Assurance department to attach the appropriate Q-Clauses to each custom part number at the time of initial release. The requirements will be based on the contract requirements and the type of commodity with inputs from the Contracts and Purchasing Departments.

2.2. Purchasing Responsibilities

2.2.1. It is the responsibility of the buyer to attach the assigned standard text to production purchase orders. This is accomplished by checking line standard text and auto loading Quality Clauses during creation of Purchase Order.


3. Q – Clauses:

Q1 - Purchase Order Specifications

All Specifications referred to in this purchase order or in drawings or other documents made a part hereof, shall mean those specifications and revisions and amendments thereto are in effect on the date of this purchase order.

Q2 - ISO 9001 Quality System - Non Aerospace

The Supplier shall establish and maintain a Quality System which is acceptable to Areté Quality Assurance Department for all product and material offerings associated with this procurement including hardware, software, processed materials and services. The Supplier’s Quality System established shall be based on ISO 9001:2008. Third party certification to ISO 9001:2008 is required.

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Q3 – AS9100 Quality System - Aerospace

The Supplier shall establish and maintain a Quality System which is acceptable to Areté Quality Operations for all product offerings associated with this procurement including hardware, software, processed materials, and services. The Quality System established shall be certified to AS9100. Third party certification or registration to AS9100 is required.

Q4 - Best Commercial Practices

Items to be supplied under this contract shall be built and inspected to a workmanship level of "Best Commercial Practices" as defined in the IPC Standards and Specifications. The Supplier's own standards of workmanship may be substituted provided that they meet or exceed the requirements of the IPC Standards and Specification.

Q5 - ESD for Manufacturing Facility


The Supplier shall take adequate Electrostatic Discharge (ESD) precautions for all electrical and electronic parts, assemblies, and equipment associated with the performance of this contract. Elements to be addressed for the prevention of ESD damage include 1) design criteria, 2) parts susceptible to ESD and their failure mechanisms, 3) handling precautions, 4) protected work areas including grounded work benches, 5) personnel training, 6) marking of documentation and hardware, and 7) protective covering/ packaging precautions. Supplier shall comply with EIA 625.

Q6 -Calibration Requirements

The Supplier shall establish and maintain a Calibration System which is acceptable to Areté for all product or service offerings associated with this purchase order. The Calibration System established shall be compliant to ISO 17025 or ANSI Z540 1.

Q7 - ESD for Non-Manufacturers

Supplier shall comply with EIA 625 current revision, when supplying electronic components which are categorized as Electrostatic Sensitive Devices.

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Q8 - Areté and Customer Access to Supplier's Facility

Areté, Areté's customer, and/or their authorized inspection agency shall have the right to send representatives to the Supplier's facilities to determine contract compliance by performing such activities as pre-award surveys, quality audits, inspections, test witness, or other evaluations and verifications as necessary. Without additional charges, the Supplier and/or their sub-contractor shall make his facility available for these activities and provide all reasonable support for the safety and convenience of those representatives during their stay at the Supplier's and/or their subcontractor's plants and facilities.

Q9 - Government Surveillance

During performance of this purchase order, your manufacturing and associated processes, products, and inspection and/or test data are subject to review, verification, examination, test, and/or analysis by authorized Government representatives. Government inspection or release of product prior to shipment is not required unless you are otherwise notified.

Q10 - Government Source Inspection

Government inspection is required prior to shipment from your facility. Upon receipt of this order, promptly notify the government representative who normally services your facility so that appropriate planning for government inspection can be accomplished.

Q11 - Required Order Information


Each packing slip, Certification of Compliance (C of C) and test report must be marked with the ordered part number and part number revision, purchase order number, lot/batch numbers and serial numbers (if applicable). Failure to comply can result in the rejection of the material.

Q12 - Areté Source Inspection

Materials on this order are subject to Areté inspection at source. Supplier shall notify Areté Procurement Department and QA Department, one week in advance of final and/or functional test, stating location, purchase order and part numbers. Evidence of Areté inspection must accompany each shipment.

Q13 - Failure and Repair Documentation

Supplier must supply one (1) copy of failure reports/repair documentation detailing all non-conformances found and the actions taken to correct them, during the repair cycle with each item shipped. This requirement also applies for items that are repaired by sub-tier suppliers. Failure to provide the above may result in non-payment of invoices against the repaired item.

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Q14 - Best Commercial for Electronic Assembly

Items to be supplied under this purchase order shall be built to a workmanship level of "Best Commercial Practice" as defined in ANSI/IPC-A-610 "Acceptability of Electronic Assemblies" The ANSI/IPC-A-610 classification level that the Supplier will meet is Class 2. Suppliers own standards of workmanship may be substituted provided they meet or exceed the requirements of IPC-A-610A Class 2. Copies of Supplier's standards are to be forwarded to Areté Purchasing for review and approval by QA prior to usage.


Q15 - First Article Inspection

First piece inspection is to be performed by Supplier prior to first shipment. Actual findings of the dimensional characteristics are to be inspected and recorded by the Supplier. A copy of the inspection report must be included with the first shipment. A limited (delta) first piece inspection and report is required for any subsequent configuration/drawing changes. The first article inspection piece will be identified and labeled in a conspicuous but temporary manner through delivery to Areté Associates Receiving Inspection.

Q16 - Multilayer Board Requirements

For Areté designed multilayer printed wiring board production, Supplier will utilize Areté supplied Gerber or artwork design files with quality conformance test circuits, the supplier shall conform to the following requirements:

- a) The supplier shall incorporate within the confines of each production panel, quality conformance test circuitry as contained in the master pattern.
- b) The quality conformance test circuits may be relocated on the panel from the position defined by the master pattern only for the purpose of reducing material loss. However, all test coupons shall appear on each panel.
- c) The number of layers of the test circuits shall be identical to the number of layers in the associated board.
- d) Surface and internal layer copper clad shall be of the same density as respective layers of the associated board.
- e) Unless otherwise specified, plated through holes in accordance when within the test circuits shall be dimensionally the same as the smallest plated through hole of the associated board.

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- f) Each test circuit shall be identified with a permanent marking material to include the associated board part number, the manufacturer's identity code, week and year of manufacture, and panel serial number. Each associated board shall also contain the panel serial number so that if separated, a test circuit can be correctly traced to the board(s) produced from the same panel.
- g) Test circuits shall be delivered in the same container with associated production board(s).

Q17 - Traceability of Materials

Material used to manufacture a part must be traceable back to its origin (Manufacturer, location of manufacturing and heat lot, or batch number).

Q18 - Copy of Test Data


Supplier will provide a copy of final inspection acceptance test data with each shipment. In those instances when test data is not generated, such as diagnostic testing, your Certification of Compliance (C of C) should state that unit/material has successfully passed all required testing.

Q19 - Certification for Calibrated Equipment

Supplier will provide Certificates of Compliance (C of C), or calibration data, attesting to conformance with calibration requirements for each quantitative measuring device contained in the equipment. Applicable documentation shall accompany each shipment.

Q20 - Certificate of Compliance

Each shipment shall be accompanied by a signed Certification of Compliance (C of C) indicating that the material or product meets the requirements of all applicable drawings, specifications, standards, and purchase order requirements and terms and conditions.

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Q21 - Special Processes

Special processes shall be certified by Supplier throughout the performance of this Purchase Order. Supplier shall qualify and approve their subcontractors for special processes which are performed on ARETE-procured products. The Supplier shall maintain adequate Controls for the processes being performed internally and externally. ARETE reserves the right to send representatives to the Supplier's facility to determine purchase order compliance to Areté drawings and technical documentation by performing process evaluation surveys and reserves the right to reject nonconforming processes which fail to meet the Purchase Order requirements. Supplier shall supply a copy of each subcontractor's certification for all special processes performed outside of their facility with each shipment.

Q22 - Raw Material Traceability

Supplier shall maintain a raw material traceability system for ARETE manufactured products. Raw materials used to manufacture products shall be documented and traceable to the manufacturer, manufacturer location, lot/batch/heat and certification of analysis/composition or specification. Supplier is responsible to ensure the integrity of the material traceability and certification paperwork.

Q23 - Shelf Life


Products shall have no more than 25% of the usable shelf life expired when delivered. Certificate of Compliance shall indicate compliance with the above limitations. A signed Certification OF Compliance (C of C) shall be supplied with each shipment. The manufacturing date and expiration dates shall be physically marked on product or packaging.

Q24 - Delivery

For purposes of the Subcontractor Performance Evaluation, delivery performance will be tracked against the delivery schedule set forth in this purchase order. Notwithstanding the F.O.B. point herein, delivery shall be deemed to have taken place only when the material has been received on dock at Areté's' facility or other destination as specified in this purchase order.

Q25 - Warranty

Warranty period for all products shall be for five years from time of receipt at Areté unless previously negotiated during the request for quote (RFQ) process.

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Q26 – Areté Documentation

Areté Associates drawings shall be the governing document in all cases. Any electronic file(s) provided by Areté Associates, are provided for reference only. In the event of any conflict or missing information, the drawing shall govern.

Q27 – First Article Inspection Report AS9102


A first piece inspection shall be performed by Supplier prior to the first shipment. The first piece inspection is required to be repeated after any part revision or process change or a lapse in production delivery greater than two years. Actual findings of the dimensional or test characteristics are to be recorded by the Supplier on Form 3 as defined in AS9102. A copy of the completed AS9102 First Article Inspection Report shall be included with the first shipment. The Supplier is responsible to supply all three Forms of this AS9102 First Article Report. They are: Form 1: Part Number Accountability; Form 2: Product Accountability and Form 3: Characteristic Accountability. The first article inspection piece will be identified and labeled in a conspicuous but temporary manner through delivery to Areté Associates QA.

Q28 – Specialty Processes

All Specialty processes must be completed by an Areté approved source. This includes any Process where it is not possible to assure, by typical verification techniques, that product integrity is achieved by the process. The supplier completing these special processes shall furnish a Certificate of Conformance (C of C) stating the process name, type, class and revision for each shipment delivered. Specialty processes include but are not limited to plating, chemical films, painting, brazing, welding and heat treating.

Q29 – Specialty Metals

Each item delivered must be certified in writing to conform with DFARS 252.225-7009, Restrictions on the Acquisition of Certain Articles Containing Specialty Metals as incorporated into the terms of this Order. This certification may be included in any other Certificate of Conformance requirement in this Order. Items that are listed as an Exception in Paragraph (b) of the clause are not subject to this provision providing the excepted item is identified and the applicable exception is clearly noted.

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Q30 – Counterfeit Electronic Parts

The seller shall ensure that only new and authentic materials are used in the products delivered to Areté Associates. The seller may only buy parts directly from Original Manufacturer or Sources with express written authority of Original Manufacturer, Authorized Aftermarket Manufacturer or Suppliers that obtain parts exclusively from one or more of these sources. Use of product that was not provided by these sources is not authorized unless first approved in writing by Areté Associates Procurement. The seller must present compelling evidence to support its request (OCM documentation that authenticates traceability, additional analysis / testing etc.) and provide copies of all objective evidence and actions taken to ensure the parts thus procured are authentic parts.

Q31 – Non-conforming Product

Suppliers are required to notify Areté Associates Purchasing in writing (e-mail is acceptable) prior to delivering any nonconforming product to Areté Associates. Nonconforming material shall be conspicuously identified as agreed upon with Areté Associates Purchasing.

Q32 – Process or Product Changes

Suppliers are required to notify Areté Associates of any changes in product or process at the Suppliers facility that affect this Areté Associates Purchase Order prior to delivering affected product.

Q33 – Control of Work Transfers


Supplier shall notify Areté Associates Purchasing in advance of any intent to transfer any work on Areté Associates products to any sub-tier supplier. This does not include any special processes where certifications are sent with the shipment that documents the actual sub-tier supplier activities such as secondary plating operations.

Q34 – Flow-Down of Requirements

Supplier shall flow down all applicable requirements from the Areté Associates Purchase Order to applicable sub-tier suppliers. This includes key characteristics as identified on the drawings.

Q35 – Specialty Processors

Special processors are required to be accredited by Nadcap (National Aerospace and Defense Contractors Accreditation Program). Special processes include plating, welding, heat treating and other processes where resulting output cannot be verified by subsequent monitoring or measurement or inspection.

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Q36 - Multilayer Board Requirements

For Areté designed multilayer printed wiring board production, Supplier will utilize Areté supplied Gerber or artwork design files. Supplier will follow general guidelines of IPC-A-600 for Printed Circuit Board manufacturing.

Q37 – Paint Requirements

Supplier shall use a painting supplier currently listed on Raytheon's Approved Supplier Listing that is qualified for the paint specification specified on the drawing. The current listing may be verified at Raytheon.com, Supplier Connections, Quality Notes – Quality Note CT, Supplier Listing.

Q38 – Contractor Counterfeit Electronic Part Detection and Avoidance Requirements (DFAR 252.246-7007)


The Seller shall ensure that Electronic Components/Assemblies are compliant to requirements of DFAR 252.246-7007 in products delivered to Areté Associates. The Seller will also establish a counterfeit part detection and avoidance system that is compliant with DFAR 252.246-7007 requirements. The Seller may only buy new and authentic parts directly from Original Manufacturer or Sources with express written authority of Original Manufacturer, Authorized Aftermarket Manufacturer or Suppliers that obtain parts exclusively from one or more of these sources. Use of electronic product that was not provided by these sources, as required in DFAR 252.246-7007, is not authorized. Electronic component traceability back to original manufacturer must be available per Areté Associates requests to Seller.

Q39 – Prohibition of Pure Tin

The uses of Pure Tin Plated finishes are strictly PROHIBITED. Any Tin Plating or Tin Solder processes shall contain NO LESS than 3 percent LEAD composition. The supplier is responsible for communicating these restrictions to sub-tier suppliers as required.

Q40 – PWB Data

Supplier shall provide a copy of final inspection acceptance, material certifications and test data from the raw PWB manufacturer with each shipment. Supplier is responsible to ensure the applicability and integrity of the inspection, material and test data provided with each shipment.

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4. Q – Clause Requirements

4.1. Q-clauses will be attached to production released part numbers in the part data management system. They will be based on the following items:

- Contract Requirements – determined during contract review process
- Commodity Type – requirements that apply to specific types of items

5. Q-Clause Examples (Typical Production Parts)

5.1. Metal Fabricated Parts

5.1.1. Q1, Q6, Q8, Q11, Q20, Q22, Q24, Q27, Q29, Q31, Q32, Q33, Q34, Q35

5.2. Printed Circuit Board Assembly

5.2.1. Q1, Q5, Q6, Q8, Q11, Q18, Q20, Q22, Q24, Q27, Q30, Q31, Q32, Q33, Q34

5.3. Printed Circuit Board Assembly (when DFAR 252.246-7007 is invoked)

5.3.1. Q1, Q5, Q6, Q8, Q11, Q18, Q20, Q22, Q24, Q27, Q31, Q32, Q33, Q34, Q38

5.4. Optics

5.4.1. Q1, Q6, Q8, Q11, Q18, Q20, Q22, Q24, Q27, Q31, Q32, Q33, Q34

5.5. Cables

5.5.1. Q1, Q6, Q8, Q11, Q18, Q20, Q22, Q24, Q27, Q31, Q32, Q33, Q34

5.6. Electro Optic Assemblies


5.6.1. Q1, Q6, Q8, Q11, Q18, Q20, Q22, Q24, Q27, Q31, Q32, Q33, Q34

5.7. Fixtures and Tooling

5.7.1. Q1, Q6, Q11, Q20, Q24, Q31

5.8. Printed Wiring Board

5.8.1. Q1, Q6, Q8, Q11, Q18, Q20, Q24, Q27, Q31, Q32, Q33, Q34

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5.9. Labels


5.9.1. Q1, Q6, Q8, Q11, Q20, Q24, Q31, Q32, Q33, Q34

5.10. Shipping Containers and Cases

5.10.1. Q1, Q6, Q8, Q11, Q20, Q24, Q31, Q32, Q33, Q34

5.11. Seals and O-Rings

5.11.1. Q1, Q6, Q8, Q11, Q20, Q22, Q24, Q27, Q31, Q32, Q33, Q34

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