

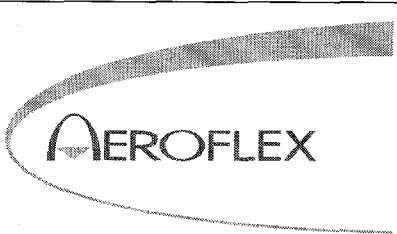
DOCUMENT REVISION HISTORY

REV.	DESCRIPTION	TYPED BY	DATE	APPROVED
Y	Revised per ECN SOP-138	-	10/31/05	KM
AA	Revised per ECN SOP-137	-	12/12/05	KM
AB	Revised per ECN SOP-142	-	4/20/06	KM
AC	Revised per ECN SOP-144	-	6/7/06	KM
AD	Revised per ECN SOP-150	KAM	2/23/07	KAM
AE	Revised per ECN SOP-152	KAM	5/31/07	KAM
AF	Revised per ECN SOP-159	KAM	1/14/08	KM
AG	Revised per ECN SOP-161	KAM	2/22/08	KM
AH	Revised per ECN SOP-164	KAM	4/9/08	KM
AJ	Revised per ECN SOP-172	KAM	9/24/08	KM
AK	Revised per ECN SOP-177	KAM	1/13/09	KAM
AL	Revised per ECN SOP-186	KAM	2/17/10	KM
AM	Revised per ECN <i>Sop-196</i>	KAM	<i>6-30-10</i>	<i>KM</i>

SUPPLIER QUALITY ASSURANCE REQUIREMENTS

PROPRIETARY: Except as otherwise agreed in writing, the information and design disclosed herein are the property of Aeroflex Plainview and must not be copied or distributed outside Aeroflex except to authorized persons with a genuine need-to-know who by the use hereof acknowledge Aeroflex ownership and agree to maintain this information and design in strict confidence.

Sheet	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rev.	AM	AA	AG	AM	AM	AM	AM	AM	AM	AM	/				

DESIGN DEPARTMENT NOT REQUIRED	DATE	TEST DEPARTMENT NOT REQUIRED	DATE	MANUFACTURING NOT REQUIRED	DATE
ELECTRONICS Q. A. <i>J. Gallea</i>	DATE <i>6/30/10</i>	MICROELECTRONICS Q. A. <i>Gary C. Heim</i>	DATE <i>6/30/10</i>	PROCESS ENGINEERING NOT REQUIRED	DATE
ELECTRICAL ENGINEERING NOT REQUIRED	DATE	DOCUMENT CONTROL NOT REQUIRED	DATE	PRODUCTION CONTROL NOT REQUIRED	DATE
 PLAINVIEW, NY 11803		CAGE CODE 88379		DOCUMENT NUMBER: SOP-QA-1075	
		SIZE A		SHEET 1 OF 10	

The following items, when specifically referenced in the purchase order by number, form a part of the purchase order in addition to all other clauses, terms and conditions, and drawings and specifications, which are, made a part of the purchase order. Unless otherwise specified, specifications referenced herein shall be of the issue in effect on the date of request for quotation.

- 1) **MIL-Q-9858A** – The Seller shall provide and maintain a quality program acceptable to the Buyer for all supplies and services covered by this purchase order. The quality program shall be in accordance with Military Specification MIL-Q-9858A. The Seller, in addition, shall establish and maintain a system, which complies with ANSI/NCSLZ540, for the calibration of all measuring, and test equipment used in fulfillment of the purchase order requirements. The application of this requirement to the purchase order does not imply authorization for independent MRB action. Requests for use of non-conforming material must be made at each specific occurrence, and approval obtained from the Buyer’s Quality Assurance Department.
- 2) **MIL-I-45208A** – The Seller shall provide and maintain an inspection system acceptable to the Buyer for all supplies and services covered by this purchase order. The inspection system shall be in accordance with Military Specification MIL-I-45208A. The Seller, in addition, shall establish and maintain a system, which complies with ANSI/NCSLZ540, for the calibration of all measuring, and test equipment used in fulfillment of the purchase order requirements. The application of this requirement to the purchase order does not imply authorization for independent MRB action. Requests for use of non-conforming material must be made at each specific occurrence, and approval obtained from the Buyer’s Quality Assurance Department.
- 3) **NHB 5300.4** – The Seller shall provide and maintain an inspection system acceptable to the Buyer for all supplies and services covered by this purchase order. The inspection system shall be in accordance with NASA Specification NHB5300-4. The Seller, in addition, shall establish and maintain a system which complies with MIL- ANSI/NCSLZ540, for the calibration of all measuring and test equipment used in fulfillment of the purchase order requirements. The application of this requirement to the purchase order does not imply authorization for independent MRB action. Requests for use of non-conforming material must be made at each specific occurrence, and approval obtained from the Buyer’s Quality Assurance Department.
- 4) **GOVERNMENT SOURCE INSPECTION** – “Government inspection is required prior to shipment from Seller’s plant. Upon receipt of this order, Seller shall promptly notify and furnish a copy to the Government Representative normally servicing Seller’s plant so that Government Inspection can be appropriately planned. If a Government Representative does not service a Seller’s plant, Seller shall contact the cognizant Department of Defense Regulating Agency for direction. If Seller cannot locate the Government Office, Seller shall notify Buyer’s Purchasing Agent immediately.”
- 5) **BUYER SOURCE INSPECTION** – Source inspection by Buyer is required for all material covered by this purchase order, prior to shipment from the Seller’s plant. The Seller shall notify the Buyer’s Quality Assurance Department at least seven (7) days prior to the date material will be ready for inspection. Buyer may reject the material if non-conforming and require that full corrective action be completed prior to shipment.
- 6) **STANDARDS OF WORKMANSHIP** - The Seller shall provide and maintain written and thoroughly descriptive standards of workmanship directly applicable to the nature and level of work to be performed under this purchase order. A copy shall be furnished to the Buyer upon request. The Buyer may disapprove standards of workmanship considered inconsistent with the work to be performed, and request correction of deficiencies. Standards of workmanship must satisfy as a minimum the requirements of MIL-HDBK-454 and any other specifications applicable to the purchase order. The Buyer may impose his own standards of workmanship if the Seller is unable to comply with this requirement.
- 7) **GOVERNMENT ACCESS** – During performance of this order, Seller’s Quality Control or Inspection System and Manufacturing processes are subject to review, verification, and analysis by authorized Government Representatives. Government inspection or release of product prior to shipment is not required unless Seller is otherwise notified. A copy of this order will be furnished to Seller’s Government Representative upon request.
- 8) **SPECIAL PROCESS CONTROL** – Buyer approval of Seller’s special processes, operating personnel, equipment and process procedures is required. Seller shall provide copies of procedures and personnel certifications upon request. If the Seller uses a facility other than his own, that facility is subject to the same conditions of Buyer approval. All certifications supplied as objective evidence must indicate the name and location of the facility performing each special process.
- 9) **CASTING REQUIREMENT** – Castings shall meet all applicable drawing requirements. An inspection report listing actual measurements of all cast dimensions must be supplied with the first article of the initial order. Test bars and material certifications representing each melt and heat shall be supplied with each shipment. All castings supplied shall not exceed applicable limitations of porosity, distortion, shifts, corrosion and shall meet dimensional requirements. Repairs shall not be made to defective items without prior approval from the Buyer’s Quality Assurance Department.
- 10) **CERTIFIED WELDERS** – All fusion welding must be performed by welders certified in accordance with SAE AMS-STD-1595. Welders who may be certified to another welding specification may be used upon specific approval from the Buyer. Any alternate specification used must meet the minimum requirements of SAE AMS- STD-1595.

* Denotes clause was revised this revision.	PROPRIETARY: Use or disclosure is subject to the restrictions shown on sheet 1	Cage Code	Document Number: SOP-QA-1075		
		88379	Rev AA	Sheet	2

- 11) **MAGNETIC PARTICLE/PENETRANT INSPECTION** – Magnetic particle/penetrant inspection shall be performed in accordance with applicable drawing requirements. Where specific requirements are not otherwise identified, the following specifications apply: a) Penetrant inspection per ASTM-E-1417, b) Magnetic particle inspection per ASTM-E-1444. Personnel performing inspections shall be qualified in accordance with NAS-410. A report of the results of inspection shall accompany each lot shipped.
- 12) **RADIOGRAPHIC INSPECTION** – Radiographic inspection shall be performed in accordance with applicable drawing requirements. Where specific requirements are not otherwise identified, ASTM-E-1742 shall apply. The Seller shall furnish X-Ray film identifiable to each part, and two copies of the X-Ray laboratory report with each shipment.
- 13) **TEST BARS** – Two (2) test bars and material certification must be submitted with each shipment of castings, for each melt and heat.
- 14) **SHEAR SPECIMENS** – The Seller shall furnish three (3) shear specimens in accordance with SAE-AMS-W-6858, for each lot of material on which resistance welding (Spot or Seam) is performed. Samples shall be prepared for each lot concurrently with the performance of welding. Welding machines shall be qualified to SAE-AMS-W-6858.
- 15) **PRINTED CIRCUIT REQUIREMENTS** – Multilayer printed wiring boards or other PWB's with plated through holes delivered against this purchase order, unless otherwise specified by the detail drawing, shall be accompanied by a micro-sectioned sample in accordance with IPC-TM-650, Method 2.1.1 from either the coupon specimen A or B of every panel produced in the lot. The coupon shall meet the requirements IPC-2221 and IPC-6011. Coupon specimens are to be thermally stressed and microsectioned only after final processing of the panel. Thermal stress testing shall be in accordance with IPC-TM-650, Method 2.6.8. A lab report is to be supplied indicating the panel number and circuits on the panel that the coupons represent. All the printed wiring boards delivered against this purchase order shall be capable of passing the structural integrity requirements specified in a) MIL-P-5110, b) IPC-6013 Performance Specification for Flex Printed Boards, c) IPC-6012 Performance Specification for Rigid Printed Boards.
- 16) **CURE/MOLDING/MFG DATE** – The Seller shall furnish with each shipment made against this purchase order complete information in accordance with applicable military specifications, relative to the limited life of the material supplied. Each unit package or container shall be marked. Rubber products, whether individually supplied or in assemblies, shall be identified as to cure or mold date. Containers of life-limited materials shall be marked with the date of manufacture and/or the expiration date. In no case shall material be supplied with more than 25% of its useful life expired.
- 17) **IDENTIFICATION/SERIALIZATION** – Each item delivered against this purchase order shall be identified by a unique part or type number. Control of individual items or lots shall be maintained by use of one or more of the following methods: date codes, lot numbers, serialization. Where individual items are furnished with inspection/test acceptance reports, each item shall be serialized and traceable to the data.
- 18) **CHEMICAL/PHYSICAL CERTIFICATION** – The Seller shall furnish certificates of physical tests and/or chemical analyses for material delivered against the purchase order. The heat, batch, melt number, etc., applicable to the material shall be included in the certificates.
- *19) **INSPECTION/TEST ACCEPTANCE REPORTS** – The Seller shall furnish inspection/test acceptance data for each specific part number delivered against this purchase order, indicating full conformance to all purchase order requirements and approved by Seller's Quality Assurance. Reports shall identify Buyer's purchase order number, Seller's name and location, item delivered, date codes or lot number or serial numbers, applicable drawings/specifications of inspection, parameters measured/tested with applicable limits and conditions, quantitative data recorded against each parameter, and a summary of results.
- 20) **CERTIFICATE OF TEST AND CONFORMANCE** - The Seller shall furnish with each shipment against this purchase order, a certificate indicating full conformance to all purchase order requirements and approved by Seller's Quality Assurance. The certificate shall identify Buyer's purchase order number, Seller's name and location, item delivered, date codes or lot numbers or serial numbers, applicable drawings/specifications, date of inspection, test performed/parameters measured with applicable limits and conditions, total quantity submitted for tests, and the quantities accepted for shipment and rejected. The certificate shall further state that test reports and certifications for all material, parts, and processes used in manufacture are on file and available for examination.

* Denotes clause was revised this revision.

PROPRIETARY: Use or disclosure is subject to the restrictions shown on sheet 1

Cage Code
88379

Document Number: SOP-QA-1075
Rev AG Sheet 3

21) **CERTIFICATE OF COMPLIANCE** – The Seller shall furnish with each shipment against this purchase order a certificate indicating full conformance to all purchase order requirements and approved by Seller’s Quality Assurance. The certificate shall identify Buyer’s purchase order number, Seller’s name and location, item delivered, date codes or lot numbers or serial numbers, applicable drawings/specifications (including revisions) and quantity delivered. The certificate shall further state that test reports and certifications for all material, parts, and processes used in manufacture are on file and available for examination.

Manufacturers and suppliers including distributors shall provide written certification that all product being provided to Aeroflex to satisfy this Purchase Order contains only new product and the supplier has in their possession acquisition traceability documentation provided by the Original Equipment or Component Manufacturer and all previous distributors for all material contained in this shipment. Military compliant microcircuits and discrete semiconductors shall adhere to the acquisition traceability requirement in MIL-PRF-38535 and MIL-PRF-19500. These documents require that manufacturer certifications follow the parts throughout the supply chain. In no case shall the acquisition traceability documentation be altered or shows signs of alteration. This is grounds for immediate rejection of the lot/shipment. The original component manufacturer’s certification shall include (at a minimum):

- Manufacturer’s name and address
- Device type
- Lot identification code (including plant code)
- Conformance inspection acceptance date
- Quantity of devices in shipment from manufacturer
- Statement certifying product conformance and traceability
- Signature and date of transaction
- Customer or Distributors name and address

Other material should include the documentation cited above for military parts as available and applicable. At a minimum the supplier shall have documentation (for example, packing slips, invoices) that confirms acquisition traceability back to the device OEM/OCM.

Acquisition traceability also includes distributor documentation for each distributor in the supply chain:

- Distributor’s name and address
- Name and address of customer as involved in the chain of custody
- Quantity of devices in shipment
- Lot/Date code

Copies of acquisition traceability documentation must be maintained by the supplier for a minimum of 5 (five) years.

The shipment record provided with each delivery of parts shall identify the Original Equipment Manufacturer (OEM)/ Original Component Manufacturer (OCM) CAGE code/ manufacturer identification, device part number and lot number/ date code if applicable. In addition each container shall be marked with the OEM/OCM identification, device part number and lot number/ date if applicable.

- 22) **QUALIFICATION DATE** – For each item on the purchase order, the Seller shall furnish with the first shipment against this purchase order, a copy of the latest completed lot evaluation performed on any device within the same family of devices. The Buyer may disapprove data considered not relevant to current production, or to the device supplied.
- 23) **OTHER** – To be defined by the purchase order. “See P.O. for details.”
- 24) Each **IC** shall be visually inspected to assure conformance with the applicable die related requirements of MIL-STD-883, Method 2010. Semiconductor die shall be visually inspected in accordance with MIL-STD-750, Method 2072 or 2073 as applicable: a) Class H (B), b) Class K (S).
- 25) Each **die** shall be electrically tested which may be done at the wafer level provided all failures are identified and removed from the lot when the dice are separated from the wafer. The minimum requirements shall include static testing at 25°C (per MIL-PRF-38534 Group A Subgroup 1 for Microcircuits and MIL-PRF-19500 Group A, Subgroup 2 for Semiconductors).
- 26) Each **passive element** shall be visually inspected in accordance with MIL-STD-883, Method 2032: a) Class H, b) Class K.

* Denotes clause was revised this revision.	PROPRIETARY: Use or disclosure is subject to the restrictions shown on sheet 1	Cage Code	Document Number: SOP-QA-1075		
		88379	Rev AM	Sheet	4

- 27) **Passive elements** shall be 100% electrically tested at 25°C in accordance with the element acquisition document. Attributes summary data shall be provided.
- 28) **Lids** shall be evaluated in accordance with the Package Evaluation requirements of MIL-PRF-38534. Attributes summary data shall be provided.
- 29) **Cases** shall be evaluated in accordance with the Class K requirements of MIL-PRF-38534, Package Evaluation paragraph C.3.8, Table C-VI with the addition of Temperature Aging Testing as specified in paragraph C.6.3.2.6 and defined below, prior to solderability requirements and Integral Substrate/Package Evaluation C.3.9, Table C-VII as applicable. Packages shall be baked per MIL-PRF-38534, paragraph C.3.9.7 when required per the detail drawing. Attributes summary data shall be provided.
- a) Temperature Aging not performed; b) Three (3) non-tested samples provided; c) Temperature aging performed and the three (3) samples provided.
- 30) **Calibration** shall be in accordance with: a) with ANSI/NCSLZ540 (Latest Revision) or, b) ANSI/NCSL Z540-1, American National Standard for Calibration, Calibration Laboratories and Measuring and Test Equipment, General Requirements and ISO10012-1, Quality Assurance Requirements for measuring Equipment (Latest Revision).
- 31) **Polymeric Adhesives** shall have been evaluated and accepted per MIL-STD-883 Method 5011 for: a) Type I-electrically Conductive, b) Type II-electrically insulative, unless otherwise specified by the adhesives' detail drawing (SCD). A Certificate of Compliance shall be provided for each adhesive order and shall contain the actual test data for the suppliers testing as prescribed in Method 5011 or MIL-STD-883. (Effective date – May 29, 1988).
- 32) **NOTIFICATION OF CHANGE** – The seller/supplier of material on this purchase order/contract shall not make any changes to the material in the design, manufacturing processes and construction. This includes location change of the manufacturing facility and location change of production lines or significant process equipment within the facility. This shall include any Class 1 change that would affect performance, quality, reliability, or interchangeability of the material to be delivered. Notification of the change must be made prior to shipment of the material and be approved by Aeroflex Laboratories Quality Assurance Department in writing to the seller/supplier of the material.
- 33) **PACKAGING OF MATERIAL** – a) Best commercial practices shall be used by the supplier when shipping to prevent damage, deterioration, or degradation of the material, b) Electrostatic sensitive devices/material must be packaged in antistatic materials or containers, consistent with the electrostatic discharge sensitivity range as described in DOD-HDBK-263 & DOD-STD-1686. All packaging shall be clearly labeled as to ESD warning or caution as required as per MIL-STD-129, c) All components shall be packaged in **conductive** materials or containers consistent with the electrostatic discharge sensitivity range as described in DOD-HDBK-263 and DOD-STD-1686. All packaging shall be clearly labeled as to ESD warning or caution as required per MIL-STD-129. All components shall be protected from static damage by the supplier during processing, packaging and shipment in accordance with DOD-STD-1686, d) All parts shall be free of contaminants and packaged in a manner to prevent packaging residue from contaminating the parts, e) Each individual container shall be marked with its –40°C storage expiration date.
- 34) **MIL-STD-1535, SUPPLIER QUALITY ASSURANCE PROGRAM REQUIREMENTS** – a) This is a Group I Procurement in accordance with MIL-STD-1535 (Latest Revision), b) This is a Group II Procurement in accordance with MIL-STD-1535 (Latest Revision), c) This is a Group III Procurement in accordance with MIL-STD-1535 (Latest Revision), d) This part has been designated as a Registered Component as per MIL-STD-1535 (Latest Revision)
- 35) **SOLDERABILITY REQUIREMENTS** – All devices and/or material supplies shall meet as applicable the following requirements:
- a) MIL-STD-202 Method 208 for other parts not covered by item (b) to item (f),
- b) MIL-STD-750 Method 2026 for semiconductors,
- c) MIL-STD-883 Method 2003 for microelectronics,
- d) J-STD-003, Category 2 for Rigid Printed Circuit Boards
- e) MIL-P-50884 Paragraph 3.4.6 for Flexible and Rigid Flex Printed Circuit Boards,
- f) IPC-S-804 Solderability Test Methods for Printed Wiring Boards,
- g) J-STD-002 for Electronic / Mechanical Components and Wires.
- 36) **MOISTURE RESISTANCE TEST** – Moisture resistance performed per MIL-STD-883 Method 1004 shall include performance of insulation resistance as specified in Method 1004. Evidence of this shall be included on the Certificate of Compliance.
- 37) As applicable per **OSHA** requirements of 29 CFR 1910.1200, the supplier of this material shall furnish a material safety data sheet with the first shipment against this purchase order, on any shipments against this order occurring more than a year from supplying the last material safety data sheet, or upon any change in the material safety data sheet.
- 38) **ELEMENT EVALUATION TESTING – Class K** – a) The Seller/Supplier of material on this purchase order/contract shall furnish an Element Evaluation Test Report in accordance with the Class K Element Evaluation requirements of MIL-PRF-38534, b) The Seller/Supplier shall furnish Aeroflex with samples for Class K element evaluation.

* Denotes clause was revised this revision.

PROPRIETARY: Use or disclosure is subject to the restrictions shown on sheet 1

Cage Code
88379

Document Number: SOP-QA-1075
Rev AM Sheet 5

- 39) **SEM Analysis – Class K** – SEM Analysis (Scanning Electron Microscope) shall be performed per MIL-STD-883, Method 2018 unless otherwise specified. The seller/supplier of material on this purchase order/contract shall furnish Class K SEM Analysis data including SEM certificate of compliance and photographs.
- 40) **RADIATION TESTING – Class K** – a) Radiation testing to be performed to MIL-STD-883, Method 1017, Method 1019, and Method 1020 unless otherwise specified. The Seller/Supplier of material on this purchase order/contract shall furnish Class K Rad certificate of compliance and data to Aeroflex, b) The Seller/Supplier shall furnish Aeroflex with Class K Radiation Testing samples.
- 41) **SOFTWARE QUALITY ASSURANCE** – Supplier must use ISO 9000-3 as a guide for any new development of software or major software change. Software includes (1) software delivered to Aeroflex, (2) software used to determine final acceptability of parts delivered to Aeroflex and (3) software used to control the manufacturing and production process of parts delivered to Aeroflex. Major software change is defined as any effort that results in 20% or more of the code being changed. A SQAPP (Software Quality Assurance Program Plan) is not required as a deliverable data item; however, supplier is required to have documented procedures for development and change of software with records maintained and available upon request.
- 42) **QUALITY SYSTEM** – The Seller shall maintain a system as defined below or an equivalent system acceptable to the buyer for all supplies and services covered by this purchase order, a) ISO 9001 – Quality Systems – Model for Quality Assurance in Design/Development, Production, Installation and Servicing, b) ISO 9002 – Quality Systems – Model for Quality Assurance in Production, Installation and Servicing, c) ISO 9003 – Quality Systems – Model for Quality Assurance in Final Inspection and Test.
- 43) **CLASS K MANUFACTURER LOT REQUIREMENT** – The Supplier shall furnish with each shipment made against this purchase order traceability of manufacturer diffusion lot including wafer number on the Certificate of Compliance.
- 44) **BUYER SOURCE INSPECTION – PRESEAL** – Source Inspection by Buyer is required for all material covered by this purchase order prior to sealing of the material. The Seller shall notify the Buyer’s Quality Assurance Department; at least seven (7) days prior to the date material will be ready for inspection. Buyer may reject the material if non-conforming and require that full corrective action be completed.
- 45) Objective evidence of **cleanfire** at 1350 to 1375°C for 1 hour minimum is required with each shipment of laser machined or BeO substrates.
- 46) All suppliers of **rigid printed boards** shall be qualified manufacturers and the boards shall be selected from the Qualified products List (QPL) for MIL-P-55110 or from the Qualified Manufacturers List (QML) for MIL-PRF-31032. Additionally, only those suppliers qualified for the laminate materials as specified on the PWB Master Drawing shall supply to this order.
- 47) All **rigid printed boards** applicable to all NASA Goddard Space Flight Center (GSFC) programs and contracts shall be in accordance with GSFC specification S312-P-003 requirements.
- 48) **PROHIBITED MATERIALS** – Prohibited Parts, Processes and Materials – QAP21-1021 contains a list of prohibited parts, materials and process that are banned from use in the manufacture of products intended for space and military applications. The supplier shall provide a Certificate of Compliance specifically attesting compliance with requirements of QAP21-1021.
- 49) **TRANSMITTING DATA** – When any kind of objective evidence or certification or test is required by this P.O. (Ref. Clause 18 & 19), the data shall be transmitted electronically (i.e. Adobe Acrobat (.PDF), etc.) by Internet, e-mail or physically in disk or CD media. The media shall be identified with the purchase order, part number and line item. This includes, but not limited to: inspection/test acceptance reports, chemical/physical certifications, attribute summary, etc. Contact the buyer for name, number or e-mail of the Incoming Inspector. Since incoming inspection must verify that the data is present upon receipt, it is imperative that the data be supplied punctually.
- 50) **OBsolete REQUIREMENTS** – This purchase order flows down obsolete requirements (i.e. MIL-I & MIL-Q, MIL-STD’s, etc.) because these requirements are specified for the end item. The supplier shall abide by these requirements to the extent necessary to assure the necessary quality and reliability.
- 51) **SMALL FACILITY QUALITY SYSTEMS** – The supplier shall maintain a quality system that best provides for compliance to the requirements of this purchase order, commensurate with the scope and complexity of the work or service to be performed, relative to the size and limitations of the facility. (Ref.: clause 42)

* Denotes clause was revised this revision.

PROPRIETARY: Use or disclosure is subject to the restrictions shown on sheet 1

Cage Code
88379

Document Number: SOP-QA-1075
Rev AM Sheet 6

- 52) **WITNESS SAMPLES FOR CONFORMAL COATING – PAINT PROCESSES, CHEMICAL CONVERSION PROCESSES AND OTHER SURFACE TREATMENTS & FINISHES** – The supplier performing this service shall perform the following actions and then deliver the requested data and samples indicating full compliance to the process performed as applicable.
- a) A record of each mix batch date or lot of material and procedure number and the revision used utilized shall be furnished as part of the shipment of the completed finishing process.
 - b) Two (2) witness samples shall be maintained for each mix batch or lot of material unless otherwise specified in the Aeroflex Purchase Order. The size and material type of the sample must be the same as the item having the conformal coating, paint process, chemical conversion processes and other surface treatments & finishes. These samples shall be processed at the same time and under the same conditions as the item(s) being finished. These witness samples shall be packaged separately and delivered with the items processed.
- 53) **SINGLE LOT/DATE/OR BATCH CODE** – Items supplied on this purchase order shall be from a single lot, date or batch code (single element) as defined being manufactured at the same time form the same homogeneous lot of material, parts, components and/or elements.
- 54) **FIRST ARTICLE INSPECTION REPORT** is required on this purchase order. The following requirements are required to be performed, listed and delivered with the item being supplied on this purchase order in hard copy or electronic media (disc/CD-ROM) in Microsoft Word, Excel Format and/or CMM format. It is suggested to use AS9102 as a guide.
- a) Aeroflex Purchase Order
 - b) Aeroflex Purchase Order Line Item Number (In the event of Multiple Line Items/Part Numbers)
 - c) Inspection Signature/Stamp
 - d) Aeroflex Drawing Number and Revision
 - e) **100% Read and Record** Dimension Values of the Aeroflex Drawing obtained during the supplier inspection. This shall reference Aeroflex Drawing Zone for the characteristic to be measured, the actual dimensional requirement stated on the drawing, tolerances and all drawing notes.
 - f) Material Chemical/Physical Certifications from the original supplier of the material used to manufacture the specific part number (i.e. aluminum, steel, titanium, etc.)
 - g) Material Finishing Certifications (Plating, Coating, Painting) specifically citing the specification and procedure required to perform the process.
 - h) Assembly parts list with individual piece parts and Drawing Revision Levels. Date/Lot/Batch Code of each part contained therein (applicable to Assemblies Only).
- 55) **SUBCONTRACTED SERVICES CERTIFICATE OF COMPLIANCE (SOURCE OF ORIGIN)** - The supplier of the item being procured by Aeroflex shall deliver a copy of the original manufacturer’s certificate of compliance for any an all processes performed in the manufacturing of this item. This pertains to but is not limited to processes such as heat treating, welding brazing, painting, plating, finishing, conformal coating, machining, micro-sectioning, outside services, etc.
- 56) **APPROVED SOURCES** - The supplier for items on this purchase order must contact the Aeroflex Purchasing Department to obtain a listing of approved sources that are part of a mandatory flow down from the prime contractor. If sources other than listed are utilized, the items supplied shall be deemed as noncompliant to the purchase order requirements and shall not be accepted by Aeroflex for its usage.
- 57) **RETENTION OF RECORDS** - Inspection and/or test records of the supplier submitting parts proving compliance to all of the Aeroflex purchase order, drawing, and statement of work and/or specifications shall be actively maintained for a period of **seven (7) years** for the purposes of data review upon request by Aeroflex unless otherwise stated in the purchase order.

* Denotes clause was revised this revision.

PROPRIETARY: Use or disclosure is subject to the restrictions shown on sheet 1

Cage Code
88379

Document Number: SOP-QA-1075
Rev AM Sheet 7

- 58) **OBSOLESCENCE/END OF LIFE** – The supplier of the product, material, component, process, circuit or other items deliverable on this purchase order shall notify Aeroflex Purchasing Department if one or any combinations of the following conditions exist:
- a) Product, material, component, process, circuit or other items deliverable are known to have Obsolescence or End of Life Issues.
 - b) The product, material, component, process, circuit or other items deliverable are currently no longer in production.
 - c) Product, material, component, process, circuit or other items deliverable are nearing the end of their life cycle and are to be discontinued from manufacturing/processing within the next five (5) years.
 - d) Product, material, component, process, circuit or other items that **Do Not** have Obsolescence/End of Life issues and will be deliverable and will be available for the next five (5) years.
- This notification to Aeroflex Purchasing Department shall be performed once on the execution of this purchase order with the following provisions: If the purchase order delivery cycle/schedule requires more than a twelve (12) month performance period, then the supplier/vendor shall notify the Aeroflex Purchasing department as a minimum every twelve (12) months of this delivery cycle/schedule for part Obsolescence/End of Life issues.
- In addition, supplier shall provide options and recommendations regarding the Obsolescence/End of Life conditions noted and notify Aeroflex Purchasing Department.
- Resolution of Obsolescence/End of Life issues may include a one time purchase of all End of Life items or the Qualification of an alternate supplier item or change/redesign of the product, material, component, process, circuit or other items deliverable on this purchase order.
- 59) **SUBCONTRACTED SERVICES** - Vendors that provide sub-contracted services (i.e. lead forming, tinning, printed wiring board assembly, marking, etc.) shall provide a quality program plan that describes how the vendor's quality organization plans to control the product for this specific purchase order or program. The program plan shall be based on the quality system specified by the PO, the source control drawing and/or statement of work.
- 60) **HYBRID MANUFACTURE** - Vendors are required to provide the documentation described below when material is validated through a supplier certification system or required as part of a MIL-PRF38534 Qualified Manufacturer Listing: (i.e. ARX-003 for Cirtek Electronics)
- a) A description of the vendor quality assurance plan with status update reports as required by the TRB or QA.
 - b) A description of the procedure used by the vendor for notification of changes in materials or processes.
 - c) A quality assurance procedure that can be performed by either the vendor or the manufacturer or a combination of both.
- 61) **IM&TE** - Inspection, Measurement and Test Equipment shall be calibrated per Clause 30 and SOP-QA-1059. Upon receipt, contact Calibration Department that new equipment has been received and then deliver for processing.
- 62) **PREFERENCE FOR DOMESTIC SPECIALITY METALS DFARS 252.225-7014 AND ALTERNATE 1 DFARS 252.225-7014** – Domestic Speciality Metals and Alternate 1 are applicable on this order. Any speciality metals used in any deliverable products must be melted in the United States or a qualifying country, Refer to DFARS 252.225-7014 for the definitions of specialty metals and the listings of qualifying countries.
- 63) **CERTIFICATE OF COMPLIANCE** – For resistors procured to specification 25JX55342, the suppliers certificate of conformance (C of C) shall state that resistors supplied on this order do not contain Nickel Chromium Film.
- *64) **SAMPES INSPECTION/TEST REPORT – DEFINED SELLER PERFORMANCE/ACTION:** One (1) line item/part of the specific part number shall have 100% of the inspection, parameters measured/tested with applicable limits and conditions, quantitative data recorded against each parameter.
- The balance of the line item/part quantity of the specific part number shall have a sample inspection performed per ANSI Z 1.4, Normal Sample, Level II, 1 % AQL on the critical dimensions/parameters as defined by the Aeroflex drawing and/or specification. The inspection, parameters measured/tested with applicable limits and conditions, quantitative data recorded against each parameter, and a summary of results shall be noted.
- The above actions do not relieve the supplier with the full compliance to the drawing, specification and purchase order requirements.
- 65) **Nonconforming Material:** Delivered material must conform to all drawing, specification, workmanship and flow down requirements specified by the purchase order. Acceptance of material by Aeroflex at the supplier's facility or at destination does not constitute a waiver if the material is subsequently determined to be nonconforming. Exceptions are not permitted unless written contractual authorization is received from the Aeroflex buyer with Quality Assurance approval. Authorization to deliver nonconforming material shall be limited to the purchase order, line item(s), part number(s) quantity and nonconformance as contractually permitted.

* Denotes clause was revised this revision.

PROPRIETARY: Use or disclosure is subject to the restrictions shown on sheet 1

Cage Code
88379

Document Number: SOP-QA-1075
Rev AM Sheet 8

- 66) **GIDEP Notification:** For a period of 10 years after date of last shipment, the supplier is required to notify the buyer within forty-eight (48) hours of previously delivered material that is discovered to be nonconforming or is the subject of a released Government-Industry Data Exchange Program (GIDEP) Alert or Problem Advisory.
- 67) **Red Plague Mitigation:** Silver coated copper wire can become corroded with cuprous oxide ("red plague") when moisture is absorbed and penetrates through pinholes or other breaks in the silver plating and invades the silver-copper interface. Therefore, the methods used to produce, store and use silver plated wire shall be controlled as described below. Wire manufacturers and distributors shall provide methods and processes for the control, transportation, and storage to mitigate the formation of "red plague". These controls should also include testing of wire (conductor only) for red plague susceptibility in accordance with ECSS Q70-20 for the lot to be supplied. The results of the testing shall be provided and so noted on the C of C.
- 1) Wire manufacturing controls shall:
 - a. provide traceability to the plating batch for each lot of wire.
 - b. have environmental controls to provide dry processing of insulation and dry electric testing to prevent introduction of moisture inside the insulation.
 - c. ensure that the wire ends are protected to prevent the diffusion of air and water vapor into the wire. The preferred protection method includes placing the wire in a heat sealed, moisture inhibiting plastic bag with appropriate quantity of desiccant.
 - d. prohibit quenching with water. Only oil, dry processing, and sealing shall be used.
 - e. note that conformance with the above controls is certified on the C of C provided.

In the event that item "e" above cannot be obtained from the wire manufacturer, a six-foot sample from each end of the wire shall be cross-sectioned and a metallographic inspection performed for the presence of cuprous oxide BY THE SUPPLIER.

2) Cable Harness Assembly Controls

- a. The cable harness fabricator shall conduct the assembly process in a controlled environment. The temperature and humidity on the controlled environment shall be monitored, documented, and maintained within the limits defined below:
 - i. Temperature: 68 - 85°F
 - ii. Humidity: 70% maximum
- b. If at any time the dew point is reached, the fabricator shall halt the assembly process and immediately relocate the cable harness to dry environment to avoid damage to the hardware.
- c. Before harness fabrication, the fabricator shall perform a visual inspection of the wire for pit, voids, cracks, evidence of red plaque, or other defects.
- d. The fabricator shall minimize the exposure of the silver plating by ensuring the insulation remains on the wire until assembly.
- e. The fabricator and subsequent handling personnel shall ensure the bend radius of two (2) cable diameters is not exceeded.
- f. Completed cable harnesses shall be placed in a non-opaque, heat-sealed, plastic bag with the appropriate amount of desiccant, a humidity indicator clearly visible, and stored in a controlled environment where the dew point is not attained.
- g. The fabricator shall not use aqueous solvent for flux removal or any other operation that subjects silver-plated wire to an aqueous solution. Only non-aqueous solvent are allowed.

* Denotes clause was revised this revision.

PROPRIETARY: Use or disclosure is subject to the restrictions shown on sheet 1

Cage Code
88379

Document Number: SOP-QA-1075
Rev AM Sheet 9

68) **Wire and Cable Certification:** Wire shall be certified through testing by a suitably qualified lab. NASA Approved test facility may be used.

1) Certification Testing

a. 100-Percent Testing

- i. Insulated single conductor wires and cable basic wires
 - a. Impulse dielectric test (no greater than 80% of military specification)
- ii. Testing for insulation flaws of cable's basic wires shall be done prior to cable assembly.
- iii. Cable

- a. Dielectric withstand of component wires
- b. Jacket flaws for shielded cables

b. Sample Testing: As a minimum, a sample or samples of each lot of wire/cable shall be subjected to the following quality conformance inspections (as applicable in accordance with the wire or cable specification).

- i. Insulated single-conductor wires and cable basic wires
 - a. Conductor resistance
 - b. Wrap test
 - c. Shrinkage (heat resistance)
 - d. Cold bend followed by wet dielectric
 - e. Visual and mechanical examination (finished wire outer diameter, identification of product, conductor diameter, strand diameter, conductor stranding, wire base metal, and plating material)
 - f. Polyimide cure test (for modified aromatic polyimide coatings only)
 - g. Crosslink proof testing (for cross-linked insulation materials)
- ii. Cable
 - a. Shield coverage
 - b. Identification of product
 - c. Jacket wall thickness
 - d. Cold bend
 - e. Thermal shock
 - f. Stress-crack resistance testing (MIL-C-17 Cable only)

Objective evidence of total conformance shall be provided by the supplier in the form of a screening traveler or by noting successful completion of the tests listed above on the certificate of conformance.

* Denotes clause was revised this revision.

PROPRIETARY: Use or disclosure is subject to the restrictions shown on sheet 1

Cage Code
88379

Document Number: SOP-QA-1075
Rev AM Sheet 10