

Supplier Qualification

Upon ESC acceptance of first article inspection or first piece(s) inspection (as required), supplier is restricted to use only those suppliers of materials, components and services (i.e., sublet machining, molding, forming, etc.) that participated in the initial contract qualification. Supplier's quality program shall maintain a listing of these suppliers, corresponding to the product or service they provide, including the associated drawing or specification by which the material or service is controlled. At time of purchase, the supplier's quality program shall assure that only those suppliers who are qualified and contained in the listing are used for follow-on purchase.

Any change in supplier participation that deviates from these qualified suppliers shall be requested in writing from ESC.

All ESC's Purchase Orders include the following basic minimum quality assurance provisions and as such are not listed as separate QAPs on ESC's Purchase Orders. By acceptance of this Purchase Order, the supplier agrees to comply with **ALL** these basic minimum Quality Assurance Provisions enumerated from 1 to 15 in addition to the specific QAP's listed on the Purchase Order.

1. PRODUCT IDENTIFICATION. Supplier part number (and revision if applicable) and ESC's part number and revision must be listed on the invoice, packing slip, Certificate of Conformance (C of C) and box, container, bag or spool label.

2. CERTIFICATE OF CONFORMANCE. Supplier shipments must be accompanied by a certificate of conformance that is signed by an authorized supplier representative including name and title with each shipment.

THE CERTIFICATION MUST BE SIGNED BY A DULY AUTHORIZED OFFICER OR QUALITY REPRESENTATIVE OF THE SELLER. THIS CERTIFICATE SHALL BE ESSENTIALLY AS OUTLINED BELOW AND MUST INCLUDE THE SAME REQUIREMENTS. THIS CERTIFICATE WILL GIVE THE MANUFACTURER'S DATE CODE FOR ALL COMPONENTS/ ITEMS.

TO: ELECTRONIC SOURCE COMPANY DATE: _____
ATTN: RECEIVING INSPECTION
CERTIFICATE OF CONFORMANCE
ESC PURCHASE ORDER NO. _____ ITEM NO/S. _____

SELLER CERTIFIES THAT:
THE MATERIALS PROCESSES AND PARTS FURNISHED ON THIS PURCHASE ORDER WERE PRODUCED IN CONFORMANCE WITH CONTRACTUALLY APPLICABLE GOVERNMENT AND/OR ESC SPECIFICATIONS AS CALLED FOR ON ABOVE PURCHASE ORDER/OR FURNISHED BY AN AUTHORIZED DISTRIBUTOR OF A QUALIFIED MANUFACTURER AND ARE FACTORY NEW.

SELLER _____

BY _____

MANUFACTURER'S DATE
CODE _____ TITLE _____

3. PACKAGING. Supplier shall package material delivered under the Purchase Order in accordance with best commercial packaging practices and in full compliance with ESD and Moisture Sensitive Materials packaging requirements. The supplier agrees to pay for any cost incurred by ESC due to the re packaging of any product supplied to ESC using incorrect packaging materials.

Highly Sensitive ESD Device

3.1 **Highly Sensitive ESD Device** shall package in ESD shield container and or bags at all time.

3.2 Care must be taken for **Highly Sensitive ESD Device** rated at 50 voltages and must be handled in an approved ESD area only.

4. FOREIGN OBJECT DEBRIS (FOD) CONTROL. Supplier shall prevent, detect and remove foreign objects that could result in foreign object damage to the products supplied under this Purchase Order using NAS412 as a guideline. Supplier's practice shall be proportional to the sensitivity of the design of the product to FOD, and to the FOD generating potential of the manufacturing methods.

5. RIGHT OF ACCESS. Supplier shall provide ESC, its customers, and regulatory authorities' access to all facilities involved in fulfillment of the Purchase Order and to all applicable records when requested.

6. DESIGN CONTROL. Supplier shall notify the Buyer of any changes in the product and/or process definition from the OEM manufacturer that will affect or alter the original part or parts listed on ESC Purchase Order.

7. COMMUNICATION. All communication, technical guidance and instructions having contractual impact shall be accomplished directly between the Buyer and the supplier's authorized representative. No contract or specification deviations shall be made without the written authorization of the ESC Buyer.

8. COMPLIANCE WITH REQUIREMENTS. Supplier shall fully comply with all instructions specified on the Purchase Order. Lack of written approval shall not relieve the supplier of the responsibility to fully comply with all of the requirements of the Purchase Order. The supplier shall not receive compensation in any form from ESC for unauthorized activity.

9. PRODUCT CHANGES. Items furnished under this Purchase Order shall be identical to product previously accepted by ESC and in accordance with original OEM manufacturer's specifications. Unless otherwise specified or prior agreement between the Buyer and the supplier, No changes shall be made in materials, processes, procedures, design interfaces or software which might affect the fit, form, function, safety, weight, maintainability, service life and or reliability, without prior written notification and approval from the Buyer.

10. MANUFACTURING FACILITY. Supplier shall notify the Buyer of any change in ownership and prior to any major plant rearrangement or plant relocation.

11. INSPECTION AND TEST RECORDS. Supplier shall retain records of all inspections and tests performed for a minimum of ten (10) years after completion of the order or as specified. Quality records shall be available for ESC review upon request.

If the Seller is a distributor of manufactured product, Seller's inspection system shall, as a minimum:

- a) Assure that product supplied to ESC has been obtained by the Seller, only from the manufacturer designated by ESC, and that records are maintained (and available for review by ESC) attesting to this fact.
- b) Assure that material is received, stored, handled, and shipped to ESC in such manner as to preclude damage, such as electrostatic discharge damage, age deterioration, or any other condition, which degrades the product quality/reliability.
- c) Assure that material supplied to ESC is not material that has been returned to the Seller by any customer or Sellers, including ESC, and is not material obtained from any other distributor, broker, etc.
- d) Require manufacturer's date code on all components/ items.

- e) Seller shall take positive corrective action to prevent continued shipment of material identified as nonconforming by ESC or retained “as is” by ESC. Seller shall determine the root cause of the nonconformance and shall make the necessary changes to his production and inspection to assure that elimination of the defect and shall document these changes and make such documentation available for review by ESC. If corrective action cannot be taken by Seller, Seller shall notify ESC of inability to correct the problem, and the reason why corrective action cannot be taken.
- f) ESC may perform reviews and evaluations as reasonably necessary to ascertain compliance with this requirement. ESC has the right to inspect and test all material covered by this purchase order, at all places and times, including the period of manufacture. If ESC performs inspection or test on the systems whether such material has been returned to Seller by ESC premises of the Seller or a subcontractor, Seller shall furnish and require the subcontractor to furnish, without added charge, all reasonable facilities and assistance for the safe and convenient performance of these duties. Such inspection and verification rights shall also be extended to ESC customer.

12. QUALITY SYSTEM REQUIREMENTS. Supplier shall maintain a quality management system that is at minimum, compliant with ISO-9001 and preferably, certified to ISO 9001, which is acceptable to ESC and in compliance with the Quality Management System specified on this Purchase Order. The supplier’s quality management system shall be subject to audit, review and approval by ESC upon reasonable notice to the supplier.

13. REQUIREMENTS FLOW DOWN. Supplier shall flow down all relevant Purchase Order requirements to their sub-tier suppliers. Supplier’s sub-tier suppliers shall comply with the same specifications and requirements specified on this Purchase Order.

14. OUR PROPERTY

All specifications, drawings, data/software, tools, materials and other items supplied by ESC to the supplier shall be maintained as proprietary to ESC and shall not be disclosed in part or its entirety by the supplier unless authorized by ESC. The items shall remain the property of ESC or our customers being represented by ESC. All such items shall be used only in the performance of this Purchase Order unless ESC consents otherwise in writing. The Supplier agrees to safeguard and remain responsible for said property until returned to ESC.

15. COUNTERFEIT PARTS

Supplier represents and warrants that only new and authentic materials are used in products delivered to ESC and contain no counterfeit parts. Supplier shall only purchase authentic parts/components directly from the Original Equipment Manufacturer (OEM) or through the OEM’s authorized/franchised distribution chain. If the supplier is not the OEM or a franchised or authorized distributor, the supplier confirms by acceptance of this Purchase Order that each product supplied to ESC has been procured from the OEM or a franchised or authorized distributor of the OEM. Supplier shall flow the requirements of this provision to its subcontractors and suppliers at any tier for the performance of this Purchase Order. Supplier shall make OEM documentation available that authenticates the traceability of the components to the applicable OEM per **QAP-B**.

- Electronic components are to be purchased only from the Original Equipment Manufacturer (OEM) or a Franchised Distributor of the OEM.
- The OEM or Franchised Distributor shall provide with the shipment a Certificate of Conformance, certifying that the component provided is the part number being procured on the ESC Purchase Order. A certificate which certifies the vendor part number, with the ESC ordered part number identified as Reference or Customer P/N, does not indicate certification to the ESC ordered part number, if the ESC/ESC’s customer drawing includes additional requirements.

- A certificate from a Franchised Distributor must also establish traceability to the Original Manufacturer. The preferable method is for the Franchised Distributor to provide a copy of the Manufacturer's certificate for the lot number being supplied, along with their Franchised Distributor certification. Acceptable, but not preferable, is a Franchised Distributor certificate identifying the Original Manufacturer.
- Electronic components may NOT be purchased from Brokers (non-franchised distributors), except in the event that the components are not available from the OEM or Franchised Distributor within ESC lead time.
- Broker must meet the same certificate of conformance requirements as those required from an OEM or Franchised Distributor (see above). If the certification requirement cannot be met, the inspection and test requirements defined below must be met.
- Broker must also provide their own certification that warrants parts to be .original. (that is, not refurbished or reworked). If Broker cannot provide this certification, the parts may not be procured.
- In the event that any source of supply (OEM, Franchised Distributor, or Broker) cannot provide a Certificate of Conformance certifying the component provided is the part number being procured on the ESC Purchase Order and establishing traceability to the Original Equipment Manufacturer, the components may only be procured if the following inspection and test requirements are met. All inspection and testing performed to satisfy the conditions of this SPOC shall be performed by a test laboratory approved by ESC. The term .Lot Acceptance Testing, as used in this SPOC, shall be defined as: Lot testing at specified temperature range, as defined in the OEM device data sheet. The data sheet may identify these requirements as Group "A" testing, critical parameters, or key performance parameters.

In the case of Integrated Circuits (IC):

- The component Supplier must verify that the physical attributes of the package meet the data sheet specifications and that the case / package marking is consistent with the marking requirements given in the OEM device data sheet and, if applicable, the ESC/ESC's customer drawing.
- The component Supplier must de-lid a minimum of one (1) sample IC from each data or lot code.
- Confirm and document that the device die is a product of the OEM indicated on the case/ package marking.
- Contact the OEM to obtain verification that die and case / package markings, as well as date / lot codes are valid. If this verification is provided, the lot is acceptable with little or no further testing.
- If OEM date and lot codes are NOT valid or OEM verifies they did NOT manufacture the part, the lot must be rejected.

If OEM verification cannot be obtained, Lot Acceptance Testing, as defined below, must be performed.

Perform Lot Acceptance Testing, if required:

- If OEM verification cannot be obtained, perform Lot Acceptance Testing, as specified on the device data sheet and, if applicable, the ESC/ESC's customer drawing.
- Sample size: As specified on the OEM's device data sheet. If no sample size is specified on the OEM data sheet, sample size shall be 116/0. That is, a sample size of 116 shall be randomly selected from each lot/date code and submitted to the specified testing.
- If the lot size is less than the required sample size (116), each and every device in the lot shall be tested and all failed devices removed from the lot.
- If any device in the sample fails any parameter in the lot acceptance testing, each and every additional device in the lot shall be tested on the same test set-up for all parameters in the test, and all failed devices

shall be removed from the lot. If this testing results in a percent defective greater than 5 percent, the results shall be submitted to the ESC buyer for lot disposition prior to the use of any devices in the lot.

- The component Supplier must verify that the physical attributes of the package meet the data sheet specifications and that the case / package marking is consistent with the marking requirements given in the OEM device data sheet and, if applicable, the ESC/ESC's customer drawing.
- Contact the OEM to obtain verification that case / package markings and date / lot codes are valid. If this verification is provided, the lot is acceptable with no further testing.
- If OEM date and lot codes are NOT valid or OEM verified they did NOT manufacture the part, the lot must be rejected.
- If OEM verification cannot be obtained, perform Lot Acceptance Testing, as specified on the device data sheet and, if applicable, the ESC/ESC's customer drawing.
- Sample size: As specified on the OEM's device data sheet. If no sample size is specified on the OEM data sheet, sample size shall be 116/0. That is, a sample size of 116 shall be randomly selected from each lot / date code and submitted to the specified testing.
- If the lot size is less than the required sample size (116), each and every device in the lot shall be tested and all failed devices removed from the lot.
- If any device in the sample fails any parameter in the lot acceptance testing, each and every additional device in the lot shall be tested on the same test set-up for all parameters in the test, and all failed devices shall be removed from the lot. If this testing results in a percent defective greater than 5 percent, the results shall be submitted to the ESC buyer for lot disposition prior to the use of any devices in the lot.

Documentation Requirements

Documentation requirements shall be in accordance with ESC and/or as directed by the procuring site's purchase order.

In the event that these minimum conditions are not met after Purchase Order acceptance, we reserve the right to withhold payment, until all provisions of the Purchase Order, including any specific QAP as listed on the Purchase Order, are met.

The following Quality Assurance Provisions (QAP) and requirements are assigned either to individual part numbers or to the entire Purchase Order for all items ordered.

QAP-A: MATERIAL CERTIFICATION

The supplier shall provide material certifications issued by the supplier, the material manufacturer, or by the supplier's sub-tier source(s) that actually provided the products or material delivered on this Purchase Order. The certification shall state the material call out, relevant specification, type, class, grade, lot number and/or date code. Certifications shall contain the signature and title of the authorized supplier representative.

QAP-B: DISTRIBUTOR TRACEABILITY TO MANUFACTURER SOURCE

The distributor shall state on their packing slip and/or on their Certificate of Conformance the name of the original product manufacturer and the date code and/or lot number of the specific part(s) in each shipment. Material shall be traceable to the actual manufacturing source. In the case of the bulk items, this may be accomplished by the bag and tag method. A copy of the manufacturers' certificate of conformance is also required with the shipment.

QAP-C: LOT NUMBER / DATE CODE IDENTIFICATION

The supplier shall list the manufacturing lot number and/or date code of the product shipped on the packing slip and on the certificate of conformance and on the product box, container, or spool label as applicable. Product shipped shall not be more than 2 years old from date of manufacture.

QAP-D: ELECTROSTATIC DISCHARGE (ESD) SENSITIVE DEVICES

The supplier shall establish and maintain qualified personnel, facilities and processes in accordance with the ANSI/ESD S20.20 or equivalent. All ESD susceptible items must be packaged and completely enclosed in a static shielding material for delivery to ESC. Static shielding material must separate any static generating materials from the ESDS items. Conductive bags are not acceptable for shipping. Microcircuit and hybrid components must be delivered in permanently conductive or static dissipative shielding tubes or containers. Tubes must be over-wrapped with static shielding packaging material when transporting ESDS items out of protected areas. Antistatic containers are not an acceptable innermost packaging of microcircuits and hybrid components and may be cause for material rejection upon receipt.

QAP-E: MOISTURE SENSITIVE DEVICES (MSD)

The supplier shall establish and maintain qualified personnel, facilities and processes in accordance with the J-STD-020 or J-STD-033 for the Control and Packaging of components classified as being Moisture Sensitive Devices that shall be packaged in re-sealable Moisture Sensitive bags and shall be properly labeled, including labeling on all boxes, shipping containers and documentation.

QAP-F: PRINTED WIRING BOARD (PWB) REQUIREMENTS

The supplier of the parts procured under this Purchase Order shall conform to IPC-6012 (Qualification and Performance Specification for Rigid Printed Boards). Class shall be specified on the master drawing. If no Class is identified then Class 3 is to be used.

Material Requirements: PWBs shall be manufactured using laminate and Pre-preg from the same manufacturer. The entire Purchase Order quantity of PWBs shall be manufactured using laminate and Pre-preg from a single source (OEM).

SMD (surface mount device) and BGA (ball grid array) Pad Size Requirements: Applicable to SMD and BGA pad sizes less than 16 mils. Pad sizes shall be consistent within a received lot within +/- 1.0 mil. The supplier shall implement and use SPC to monitor critical SMD and BGA pad size requirements. Real time process control charting must be implemented. Where Cpk values are < 1.33 a cause and corrective action shall be submitted. SPC data shall be included with the electrical test data package.

The supplier shall be responsible for maintaining serialization information pertaining to shipments, however, the serial numbers shall be listed on each lot Certificate of Compliance.

Coupons/Micro-sections: Micro-sections information shall be maintained on file by the supplier. The supplier's micro-sections shall be shipped with the boards and shall be compliant to Table 4-3 (Acceptance Testing and Frequency) per IPC-6012. The micro-sections will be returned after evaluation by ESC if requested by the supplier.

Table 4-3 Acceptance Testing and Frequency Inspection Data: Table 4.3 (per IPC-6012) inspection data shall be submitted with all shipments.

Solderability Test Certificate: The supplier shall furnish certification of acceptance of a solderability test conducted per IPC/EIA J-STD-003.

The certification shall state:

1. Test method used.
2. Number of samples tested, accepted, rejected.
3. Date of solderability test.

The supplier shall also retain a copy of all test data on file for ten (10) years after completion of this Purchase Order.

Electrical Test Requirement: Bare board testing shall be performed in accordance with IPC-9252. Continuity and isolation of each circuit path as defined by the Net List or Gerber data shall be verified for each MLB (multilayer board).

Rework Restrictions: No rework for Bow or Twist and circuit repair is allowed. PWBs shall meet Bow and Twist requirements as laminated and shall have no evidence of circuitry or substrate rework. PWBs shall be 100% verified for Bow and Twist.

QAP-G: MIL-PRF-55110 PRINTED WIRING BOARDS

The supplier shall be currently qualified to Mil-PRF-55110 for board type and material specified for this Purchase Order. Material supplied to this Purchase Order shall meet the requirements of Mil-PRF-55110.

A minimum of one (1) quality conformance test coupon per panel shall be included with each shipment of boards. For traceability, each coupon shipped shall be identifiable with the corresponding production boards produced on the panel with the coupon.

QAP-H: PRINTED WIRING BOARD (PWB) REQUIREMENTS – IPC CLASS 3

The materials, fabrication and test requirements for PWBs shall meet the IPC Class 3 Industry Standard requirements of the following specifications:

1. Design (IPC-2220 series)
2. Qualification and Performance (IPC-6010 series)
3. Inspect/Test/Acceptability (IPC-A-600, IPC-TM-650, IPC-QL-653, IPC-MI-660)

QAP-I: MICRO-SECTION COUPON**1. Micro-section and coupon requirements:**

With each delivery of boards or flex circuits except Type 1 (single sided) and Type 2 (double sided) the supplier shall include the micro sections used for product acceptance and coupon strips representing each panel for which product is delivered. Supplier will conform to all Military and Industry specifications referenced on the procurement documents associated with this procurement. The following standard IPC micro-sections for each panel will consist of (as a minimum):

- a. "A and B" micro-sections from opposite corners of the panel that have not been solder floated (as received).
- b. The following micro-sections are required in the "X" and "Y" direction from opposite corners of the panel:
 - 1) "A" micro-sections that have been solder-floated. (Note: This is only required if the hole size is larger than the hole on the "B" micro-section. The larger hole will be used to detect post separation.)
 - 2) "B" micro-sections that have been solder-floated.

If the supplier uses the "A/B" micro-sections then the following are required:

- c. "A/B" micro-sections from opposite corners of the panel that have not been solder-floated (as received).
- d. "A/B" micro-sections from opposite corners of the panel (one in the "X" and one in the "Y" direction) that have been solder floated.
- e. Coupon strips representing the micro-sections in paragraphs a, b or c, d above.
- f. If the board contains blind or buried vias, one set of micro-sections representing these features must be submitted.
- g. Any special coupon strips (impedance, peel strength, wire bond, etc.) that are specified on the master drawing. The coupon strips and micro-sections listed above will not be returned to the supplier. The supplier shall retain other acceptance micro-sections and additional coupon strips that are a part of the fabrication panel.

2. Documentation requirements:

- a. Certificate of Conformance (C of C) stating conformance to the specifications.
- b. A list of the panel numbers and corresponding boards shipped. Also, indicate which panels were scrapped at your facility.
- c. A list of the panel numbers for which micro sections were submitted. Micro sections must be marked to indicate panel number.
- d. Electrical test results to include impedance data if applicable.
- e. Statement of results of "R" coupon testing by panel number if used to verify acceptable internal layer registration. Use of a "modified F" coupon is acceptable in some cases if it is used for the same purpose as the "R" coupon.
- f. If the printed circuit board micro-section fails external annular ring, state that the boards themselves were checked for registration and pass, if the boards are to be delivered.

3. Retention requirements: The supplier is responsible for maintaining a set of micro-sections and coupon strips which represent the product delivered. However, if only one set remains and, in order to satisfy the requirements of this QAP, that set is delivered to ESC.

QAP-J: SOURCE INSPECTION BY ESC'S REPRESENTATIVE

All items required by this Purchase Order are subject to ESC'S inspection at the supplier's facility prior to shipment. The supplier shall provide no less than seventy-two (72) hours advance notice to the ESC Buyer to permit scheduling of the required inspection.

QAP-K: FIRST ARTICLE INSPECTION/TEST REQUIREMENT

Supplier shall conduct a complete first article inspection and/or test (FAIT) in accordance with SAE AS9102 requirements on one part chosen from the first production lot of the initial Purchase Order. The supplier shall provide one (1) copy of the AS9102 First Article Inspection Report (FAIR) to ESC with the supplier's packing slip and C of C along with materials certification with the first delivery of parts on this Purchase Order.

QAP-L: 100% PRODUCT INSPECTION

100% inspection shall be performed on each product supplied under this Purchase Order for all product characteristics, including drawing notes. Records of inspection results showing actual values shall be maintained by the supplier and one (1) copy of each record shall be included with the shipment. Each record shall be traceable to the individual product to which it applies by serial number or other unique identification. The records shall contain the ESC's Purchase Order number, part number and revision.

QAP-M: LOT SAMPLING

100% inspection of all characteristics, including drawing notes, shall be performed on a sample of each part number from each lot supplied under this Purchase Order. Lot sampling shall be in accordance with ANSI/ASQ Z1.4-2003. A sampling plan that accepts on zero defects is required. Records of inspection results showing actual values shall be maintained by the supplier and one (1) copy of each report shall be included with the shipment. The inspection reports shall contain the ESC's Purchase Order number, part number and revision and shall indicate the sample size. The samples shall be segregated from the balance of the lot and shall be identified as samples.

QAP-N: IPC/WHMA-A-620 COMPLIANCE

Products delivered under this Purchase Order shall meet the acceptance criteria of IPC/WHMA-A-620 for Class 3 products. When requested, the supplier shall provide certification that products comply with IPC/WHMA-A-620 Class 3. Certifications shall contain the signature and title of the authorized supplier representative.

QAP-O: ANSI/J-STD-001 COMPLIANCE

The supplier shall establish and maintain qualified personnel, facilities and processes in accordance with ANSI/J-STD-001 for Class 3 products. When requested, the supplier shall provide certification that products comply with ANSI/J-STD-001 Class 3. Certifications shall contain the signature and title of the authorized supplier representative.

QAP-P: ISO9001 COMPLIANCE

Supplier shall maintain a quality management system in accordance with the requirements of ISO9001. Supplier's compliance with ISO9001 and this QAP shall be demonstrated by submission to ESC of the supplier's valid registration certificate issued by an ANAB accredited certifying body.

QAP-Q: AS9100 COMPLIANCE

Supplier shall maintain a quality management system in accordance with the requirements of AS9100. Supplier's compliance with AS9100 and this QAP shall be demonstrated by submission to ESC of the supplier's valid registration certificate issued by an ANAB accredited certifying body.

QAP-R: DPAS RATING

By acceptance of this Purchase Order the supplier is accepting it as a priority rated order in support of the indicated U.S. Government contract number with a priority rating as stated in the Purchase Order. By acceptance of this Purchase Order the supplier agrees to comply with the provisions of the Defense Priorities and Allocation System (DPAS) regulation 15 CFR Part 700 except that Purchase Orders with a "DO" priority rating must be accepted or rejected by the supplier within 10 working days and Purchase Orders with a "DX" priority rating must be accepted or rejected by the supplier within 5 working days from receipt of the order.

QAP-S: SOLDER CERTIFICATION

The supplier shall provide certification stating that solder compositions supplied under this Purchase Order conform to the requirements of ANSI/J-STD-006. Certifications shall contain the signature and title of the authorized supplier representative.

QAP-T: FLUX CERTIFICATION

The supplier shall provide certification stating that the rosin-based flux supplied under this Purchase Order conforms to the requirements of ANSI/J-STD-004. Certifications shall contain the signature and title of the authorized supplier representative.

QAP-U: SOLDERABILITY CERTIFICATION

The supplier shall provide certification that the material/product supplied under this Purchase Order meets the solderability requirements as specified in ANSI/J-STD-001. Certifications shall contain the signature and title of the authorized supplier representative.

QAP-V: LIMITED SHELF LIFE MATERIALS

The supplier shall provide with each shipment the required storage conditions and/or shelf life expiration dates (as applicable) and the date of manufacture (DOM), date of expiration (DOE) and the lot number. This information shall be shown on the packing slip, the C of C and on the material container (jar, bottle, can, tube, etc.) When materials with limited shelf life are received at ESC, we would expect to have 95% of the useful life remaining. ESC will not accept materials with less than 75% shelf life without written authorization from the ESC buyer. An example of justification for limited life would be: Material urgently needed, or material to be used within the specified shelf life remaining. Failure to comply with this provision may result in material rejection.

QAP-W: MATERIAL SAFETY DATA SHEETS

All materials that are volatile, toxic or which emit fumes that are harmful to human health shall be properly contained in accordance with applicable health and safety requirements. The containers shall be plainly marked as to contents with appropriate warnings, precautions, instructions and storage conditions. Material Safety Data Sheets (MSDS) shall be provided with each shipment.

QAP-X: CALIBRATION SERVICES

The supplier shall provide calibration services that are traceable to the National Institute of Standards (NIST). A certificate of calibration that conforms to either ISO/EIC 17025 or ANSI/NCSL Z540 (supplier's option) shall be provided. Calibration shall be performed to the original equipment manufacturer's specification. When an "Out of Tolerance" indication is discovered the information concerning the out of tolerance condition shall be provided in writing, and the affected item shall be properly tagged and segregated from the items found within tolerance at the time of calibration service completion or delivery.

QAP-Y: SPECIALTY METALS

This Purchase Order is subject to the Defense Federal Acquisition Regulation Supplement (DFARS) clause 252.225-7009, Restriction on Acquisition of Certain Articles Containing Specialty Metals. By acceptance of this order the supplier agrees to provide a certificate of compliance to the DFARS requirement. The supplier shall list the "qualifying country" of origin (refer to DFARS clause 225.003) of specialty metals on the material certification provided per QAP-A. The supplier shall flow down this requirement to all sub-tier suppliers. DFARS clauses can be accessed at <http://www.acq.osd.mil/dpap/dars/dfars/index.htm>.

QAP-Z: PLATING CERTIFICATION

The supplier shall provide plating certifications issued by the supplier or supplier's sub-tier source(s) that actually performed the plating of the product delivered on this Purchase Order. The certification shall state the plating specification, the type and class, with corresponding thicknesses and lot number. Certifications shall contain the signature and title of the authorized supplier representative.

QAP-AA: HEAT TREAT CERTIFICATION

The supplier shall provide heat treat certifications and reports issued by the supplier or supplier's sub-tier source(s) that actually performed the heat treat process to the product delivered on this Purchase Order. The certification and reports shall state the specification to which heat treating was performed and the condition achieved. Certifications shall contain the signature and title of the authorized supplier representative.

QAP-AB: EXCLUSION OF MERCURY

1. Supplies furnished under this Purchase Order shall contain no free mercury (metallic form) or mercury compounds (e.g. mercuric oxide and mercuric chloride) without written approval from ESC. Seller shall perform a review to the extent necessary for a reasonable assurance that mercury is not being used in the supplies (e.g. review of drawing parts lists and material lists.)

2. Mercury bearing instruments and equipment (i.e. those instruments containing free mercury) shall not be used in the manufacture, fabrication, assembly, testing, cleaning or packaging, etc., of any supplies pertaining to this Purchase Order.
 - a) The most probable causes of mercury contamination are direct connected manometers, mercury vacuum pumps, mercury seals, mercury-in-glass thermometers or handling free mercury in the immediate vicinity of supplies.
 - b) The supplier shall perform a review of their facilities to provide reasonable assurance that supplies are not in danger of mercury contamination (e.g. check of instruments, test equipment, cleaning agents, etc.)
 - c) In case of doubt or question regarding mercury, contact ESC for assistance.
 - d) Accidents involving actual or suspected mercury contamination (during product realization or after delivery) of supplies identified on this Purchase Order must be immediately communicated to ESC. Suspected product shall be identified, segregated or positively recalled for proper disposition.
3. Supplier shall develop the same assurance and confidence of compliance with the mercury exclusion clause as it does with other specification requirements (e.g. toxic materials, flammable materials, fragile materials & radioactive materials.)
4. The supplier shall flow down and require all their sub-tier suppliers to comply with the mercury exclusion requirements invoked on this Purchase Order.
5. A Certificate of Compliance for mercury exclusion or other attesting documentation must be provided to ESC at the time of finished product and/or supplies delivery.