



**P.O. ATTACHMENT
SUPPLIERS QUALITY REQUIREMENTS**

The provisions listed below shall be made part of the Purchase Order when referenced on the face of the order. Only those listed by number on the P.O shall apply. The latest revision of all specifications in effect at the time of award of Purchase Order (unless otherwise noted on the procurement document) shall apply. **Any deviation to an assigned VQR must be approved by EMCORE QA and stipulated on the PO.**

1.0 QUALITY SYSTEM REQUIREMENTS

The Supplier's Quality System should comply with the requirements of one of the following:

- A.) MIL-I-45208
- B.) MIL-Q-7858
- C.) NHB 5300.4 (1B)
- D.) NHB 5300.4 (1C)
- E.) MIL-STD -45662
- F.) AS9100 / ISO9001
- G.) RESERVED
- H.) INSPECTION PLAN

Note: This VQR will be verified through Purchasing during the Supplier Qualification/Review process. Inspection will verify this VQR by checking that the supplier is listed on the Approved Vendor Lists (AVL).

Please note: Supplier is responsible for maintaining an up to date Quality System Certification. If this Certification changes status at any time, Supplier is to notify Buyer within one week of the change (e.g. completion of recertification, loss of certification or effectivity date changes).

Also note, the level of compliance required to the above will be determined, reviewed, and approved via signatures on the Inertial Vendor Master form, SD16-005.

2.0 SOURCE INSPECTION

A.) EMCORE SOURCE INSPECTION

All items on this Purchase Order require Inspection and/or test, by an EMCORE Quality Representative at the Seller's facility prior to shipment. EMCORE Quality Assurance shall be notified forty-eight (48) hours in advance of the time articles are ready for inspection.

B.) EMCORE SOURCE SURVEILLANCE

All Items on this Purchase Order are subject to surveillance by EMCORE and/or

EMCORE's customer, during the period of manufacture, processing, inspection, and/or testing. Upon receipt of this order, and prior to commencement of performance, contact EMCORE Quality Assurance or the Field Representative servicing your facility to arrange scheduling of such surveillance.

C.) GSI/EMCORE RIGHTS

The Government and/or EMCORE reserve the right to inspect any or all of the work included in this order at the Seller's plant.

D.) GOVERNMENT SOURCE INSPECTION

D.1 Government Inspection is required prior to shipment from your plant. Upon receipt of this order, promptly notify the Government Representative who normally services your plant so that the appropriate planning for Government Inspection can be accomplished.

D.2 On receipt of this order, promptly furnish a copy to the Government Representative: if none, to the nearest Army, Navy, Air Force or Defense Supply Agency Inspection office. When a representative or office cannot be located, our Purchasing Office should be notified immediately.

E.) GOVERNMENT INSPECTION

During performance on this order, your Quality Control or inspection system and manufacturing processes are subject to review, verification and analysis by authorized Government representatives. Government Inspection prior to release of product for shipment is not required unless you are otherwise notified. You shall provide a copy of this order to your Government Representative upon his request.

3.0 FIRST ARTICLE INSPECTION

A.) FIRST ARTICLE INSP. AT DESTINATION

The compliance of Seller's design with requirements of applicable engineering drawings and specifications will be determined for inspection and acceptance by Buyer of one (1) first article sample representative of the production process. Said samples shall be delivered to Buyer's plant and must be accepted prior to production run. All samples shall be tagged or otherwise identified. All data resulting from the Seller's first article inspection shall be submitted with the first article. Seller will be notified in writing of disposition (approval or rejection).

B.) FIRST ARTICLE INSP. AT SOURCE

First article inspection shall be accomplished at the Seller's plant. EMCORE Quality

Engineering shall be notified at least forty-eight (48) hours in advance and shall witness the First Article Inspection and shall verify results by authenticating the appropriate documents. Verification of such results shall not constitute acceptance of any item required to be delivered hereunder, nor relieve the Seller of its obligation to furnish items meeting the applicable drawing and specifications.

4.0 TEST PROCEDURE APPROVAL

A.) ACCEPTANCE TEST PROCEDURE

Seller shall obtain EMCORE approval of this acceptance test procedure prior to conducting tests on items to be delivered under this order.

B.) QUALIFICATION TEST PROCEDURE

Seller shall obtain EMCORE approval of his qualification test procedure prior to conducting tests on items to be delivered under this order.

5.0 DATA/REPORTS

A.) ACCEPTANCE TEST DATA

Each shipment against the order must be accompanied by a copy of Sellers acceptance test(s) data to provide evidence of compliance with all acceptance test requirements.

B.) PHYSICAL/CHEMICAL REPORT

A validated physical/chemical test report must accompany all shipments made against each item of this Purchase Order, which indicates the percentage of each element that makes up the chemical composition and physical properties of all raw materials. This report shall specifically identify the material by reference to the number of the melt, cast, heat, drop, lot or other similar designation and must indicate the applicable specification, revision, and Purchase Order designation.

C.) PHYSICAL/CHEMICAL ANALYSIS

Seller shall maintain results of chemical and physical analysis performed on raw materials, which are employed in fabrication or articles, purchased on this order and shall make these available upon request.

D.) INSPECTION DATA

One copy of Seller's inspection acceptance data, identifiable to the material submitted, must accompany each shipment.

E.) CATALOGS

The initial shipment of items on the Purchase Order shall be accompanied with drawings and/or catalog for receiving inspection purposes.

6.0 TRACEABILITY/IDENTIFICATION

A.) TRACEABILITY SYSTEM

The Seller shall, in the performance of this Purchase Order, provide and maintain a system of traceability on all material, components and parts.

B.) LOT IDENTIFICATION

The Supplier shall assign a lot identification for each batch or manufactured lot. A lot is defined as a quantity that has been blended, mixed or fabricated during an uninterrupted manufacturing run. Each item in each lot shall be properly identified with the assigned lot number.

C.) SINGLE LOT

All items furnished in accordance with this Purchase Order shall be of the same manufacturing lot. The manufacturing lot number shall be indicated on the shipping papers.

Should supplier have only mixed lots available at shipping date and authorization of shipment must first be obtained from EMCORE Quality Assurance.

D.) SERIALIZATION

The Supplier shall design and permanently identify each unit manufactured, inspected, tested and shipped with an individual serial number. The Supplier's method for assigning serial numbers shall be such that the same number cannot be used more than once. The Supplier's inspection and test records for each end item furnished shall be identified by the assigned serial number.

7.0 AGE CONTROL/CURE DATES

A.) AGE-SENSITIVE MATERIAL

The articles furnished in accordance with the Purchase Order are subject to Age Control. Seller shall mark articles with batch or lot number, date of manufacture, cure date, storage environment, and/or shelf life as applicable. Articles subject to age deterioration shall not be supplied when more than 25% of the shelf life has expired.

B.) RUBBER CURE DATE

Seller shall mark the cure date per AHA Bulletin 438 on all shippers, containers; packages, parts/raw stock. Assemblies shall be marked with cure date of rubber parts contained therein.

- I. Cure date shall not exceed four (4) quarters at time of delivery.
 - II. Assembly date of assemblies with rubber parts shall not exceed four (4) quarters at time of delivery
- C.) Seller or manufacturer shall provide batch or lot number traceable to date of manufacture and/or shelf life as applicable.

8.0 SPECIAL PROCESSES APPROVAL/CERTIFICATION

A.) Special processes, equipment and personnel utilized in performance thereof, shall be subject to approval or certification by EMCORE Quality Assurance. Certification of special processes performed by a lower tier supplier is the responsibility of the seller (first-tier supplier). Objective evidence of special process certifications of the Seller's lower-tier supplier(s) shall be available to the EMCORE Quality Assurance at the facilities of the Seller and at the sub-tier supplier's facility utilized in the performance of this order.

B.) APPROVAL

Processes performed by the Seller or his subcontractors, such as welding, heat treating, cleaning, electro-plating, anodizing, chemical filming, nondestructive testing, etc. require EMCORE Quality Control approval prior to fabrication under this order. Objective evidence of process specification compliance must be retained in accordance with Appendix "M" of the Armed Services Procurement Regulation (ASPR) and be made available to EMCORE and/or the Government on request.

C.) CERTIFICATION

Process Certification must accompany all shipments to EMCORE and shall identify the processor, process used and the specification to which they conform. When non-destructive tests are performed, the certification shall be accompanied by a legible copy of the test report.

9.0 NON -CONFORMING MATERIAL

A.) MRB

Seller's items which adversely effect form, fit function or reliability and not conforming to EMCORE specifications shall be disposition by EMCORE Material

Review Board (MRB) prior to shipment. Disposition by EMCORE MRB may be obtained by contacting the cognizant EMCORE buyer. MRB authority is not delegated to the Seller where nonconformance affects form, fit, function or reliability.

10.0 REJECT MATERIAL

A.) Seller shall conduct failure analysis on returned products as required by Buyer and furnish documented report(s) of the results to the Buyer. Each failure analysis report shall contain the basic identification information as to the type of hardware that failed, a description of the analysis that was conducted on the failed part, the conclusions derived as a result of the analysis and the corrective action taken to prevent a reoccurrence of the failure. Buyer reserves the right to witness the failure analysis.

B.) RESUBMISSION

All items rejected by EMCORE and subsequently resubmitted by Seller shall adequately indicate resubmission on the shipping document. Reference shall be made to the original purchase order and present evidence that the cause for rejection have been corrected.

11.0 REQUALIFICATION

A.) REQUALIFICATION on previously qualified items may be required as determined by EMCORE when a change is made to the design or the production process. Specific situations which generate a requirement for requalification include:

1. Any change in hardware design or specification
2. A manufacturing source
3. A new manufacturing source
4. Relocation of manufacturing or processing facility.
5. Interruption of 90 or more days in production of the item.

Supplier, or sub-tier suppliers, anticipating or experiencing any of the above shall notify EMCORE within three (3) working days if any of these situations become apparent. EMCORE will provide suppliers with specific requalification requirements when required.

12.0 CERTIFICATE OF COMPLIANCE

A.) CERTIFICATION

A certificate of compliance indicating the part number, part name, date, applicable

specifications and authorized signature shall accompany each shipment against this order. Each certification shall include the following elements:

"Material and/or parts furnished on this order have been manufactured in accordance with all applicable instructions and specifications and such records are on file and available for inspection."

13.0 DESIGN/PROCESS CHANGE AND MRB AUTHORITY

A.) Seller shall notify EMCORE of any proposed changes in part design, fabrication method or process and obtain approval of the change from EMCORE prior to making the change. Change articles shall be identified so as to segregate them from the unchanged articles. The supplier may disposition nonconformance for rework or touch-up. MRB authority is not delegated to the supplier for repair or use-as-is dispositions.

B.) EMCORE Notification. Seller shall notify EMCORE of any proposed change in part design, fabrication method or process. The supplier may disposition nonconformance for rework or touch-up. MRB authority is not delegated to the supplier for repair or use-as-is dispositions.

14.0 SAMPLE INSPECTION

A.) EMCORE APPROVAL

Fourteen (14) days prior to the performance of any sampling inspection and/or test (other than 100%) on material to be furnished to EMCORE, the supplier shall submit these sampling plans to EMCORE for review and approval by a cognizant Quality Manager

B.) MIL-STD -105

Any sample inspection performed on articles supplied on this Purchase Order shall be in accordance with the requirements of MIL-STD-105.

C.) DISALLOWED

Sample inspection of items furnished on this Purchase Order is not permitted. 100% inspection of all items is mandatory.

15.0 SPECIAL REQUIREMENTS

A.) CERTIFICATION

A certificate of compliance indicating all material furnished on this order is free of

Palladium and Palladium derivatives.

B.) OTHER

16.0 MIL-S-19500 REQUIREMENTS

A.) MANUFACTURER TRACEABILITY DOCUMENTATION
Each shipment against this order must be accompanied by a copy of manufacturer's documentation per paragraph 3.31 of MIL-S-19500 .

B.) DISTRIBUTOR/MANUFACTURER TRACEABILITY DOCUMENTATION
Each shipment against this order must be accompanied by a copy of distributor's and manufacturer's documentation per paragraph 3.3.1 of MIL-S-19500.

C.) GOVERNMENT INSPECTION RIGHTS PURCHASE ORDER TO DEVICE MANUFACTURERS
During performance on this order, your quality control or inspection system and manufacturing processes are subject to review, verification and analysis by authorized Government Representatives. Government stamping of lot tractability documentation is required. Government release of shipments is not required unless otherwise notified.

D.) GOVERNMENT INSPECTION RIGHTS PURCHASE ORDER TO OTHER SUPPLIER
During performance on this order, your control of device lot traceability documentation and your inventory control for MIL-S-19500 JAN branded devices are subject to review validation and verification by an authorized Government Representative. Government release of shipment is not required unless you are otherwise notified.

E.) INVENTORY CONTROL SYSTEM
The seller shall, in the performance of this purchase order, provide and maintain and inventory control system on all JAN devices of a manufacturer's lot number.

17.0 MATERIAL SAFETY DATA SHEETS

A.) California Hazardous Substances Control Act SD1874 requires Safety Data Sheets (SDS) accompany the shipment of all hazardous material.

18.0 PRODUCT TECHNICAL DATA

A.) Product Technical Data requested with shipment.
Suppliers providing the same product on a

reoccurring basis are requested to provide Product Technical Data with first shipments and are requested to provide updated data when composition change occurs.

19.0 CALIBRATION

- A.) The supplier shall provide for a calibration control system that complies with ISO 10012-1 (or equivalent). Calibration may be provided by an outside service, but calibration and equipment maintenance records must be made available for EMCORE review.

Equipment, tooling and fixtures used in the performance of this contract shall be under calibration control.

20.0 ESD

- A.) ESD S20.20, For the Development of an Electrostatic Discharge Control Program for – Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices), and/or MIL-STD -1686 Electrostatic Discharge Control Program Requirements apply to the Purchase Order. The supplier shall have implemented an ESD control program. This VQR is applicable only if the supplier is furnishing electrical components that have an ESD. The supplier shall insure that Electrostatic Discharge (ESD) Controls are in place at all times--from receipt of components through shipment of final product, including packaging.

21.0 STATISTICAL PROCESS CONTROL

- A.) The supplier shall have a system of Statistical Process Control (SPC), pre-control, process capability (Cp & Cpk) or other statistical technique in place for this order. Data shall be furnished to EMCORE upon request.

22.0 COUNTERFEIT & OBSOLETE

PARTS

- A.) The Seller shall only purchase components and parts procured directly from the OCM/OEM, or through the OCM authorized distributor chain. Procurement through an Independent Distributor or Broker is NOT authorized, unless first approved in writing by EMCORE.

Supplier is not authorized to use obsolete parts unless approved by EMCORE.

Information such as component storage conditions, procurement history, condition, packaging, etc. is expected to be available for EMCORE review prior to authorization.

23.0 COMPONENT LEAD FINISH

- A.) A process objective of at least 80% coverage of component lead terminations is required. The criteria is intended as a process guideline which is accomplished by insuring that there is sufficient solder paste applied to achieve the coverage. If required to achieve 80% tin-lead solder coverage, the leaded components with tin plating shall be pre-tinned using lead bearing solder prior to installation.

24.0 PCB/PCBA ADDITIONAL REQUIREMENTS

- A.) COMPONENT VALUE VERIFICATION: Component values placement shall be verified at the beginning of each lot run using the pick list generated by the SMT equipment. The placement list should accompany the C of C.

- B) BETTER THAN COMPONENTS:

PASSIVE

If the Supplier furnishes electrical components, better-than passive components may be substituted with notification to EMCORE as follows. The notification will be contained in the Certificate of Compliance that accompanies each delivery:

- Tolerance may be tighter than specified.
- Voltage rating may be higher than specified.
- Operating temperature range may be wider than specified.
- Temperature coefficient (PPM/°C) may be lower than specified.
- Storage temperature may be wider than specified.

PASSIVE & ACTIVE

Changes in parameters (other than what's stipulated above for passive components) require prior EMCORE approval (e.g., size, material, manufacturer, lead-finish, testing, etc.).

Note, changes for component part numbers are allowed only if it is the bulk/volume package equivalent of the individual component part number.

- C) PCB/PCBAA MARKING: The supplier shall mark or stamp each completed PCBA assembly, which passes quality inspection in a location and manner mutually acceptable to the customer and supplier.

The supplier shall mark or stamp each completed PCB/PCBA with a lot date code in a location and manner mutually acceptable to the customer and supplier. The lot date code shall include SSSYYWW-XXXX where SS is the Supplier Code (provided by EMCORE), YY is the Year the pick and place was completed, WW is the Week the pick and place was completed, followed by XXXX (Serial number). Markings must be in permanent non-conductive ink. Labels may be used on a pre-approved basis and must withstand EMCORE manufacturing and cleaning processes.

- D) BGA XRAY: As applicable per the BOM, all BGA devices shall be inspected using top down and oblique 45° shots using high resolution X-ray equipment to insure proper placement and solder connections per IPC-A-610, Class 3. The resulting X-ray images are to be provided to EMCORE on a CD along with the completed assemblies.

- E) FIRST ARTICLE DELIVERY: Prior to delivery of the first lot, the Supplier shall send an agreed upon quantity of the completed PCBA assemblies of each type to EMCORE for detailed inspection. These first article assemblies shall be fabricated using the same process that will be used to make the production run. Upon successful completion of the first article evaluation, the Supplier may deliver (or continue processing) the remainder of the first lot.

- F) PCB/PCBA PACKAGING: All deliverable PCB/PCBA's shall be individually packaged in ESD safe bags or containers and shall be properly protected against moisture, electrical and mechanical shipping damages.

The shipping container and all paperwork shall be identified with the EMCORE PO number, applicable P/N, lot identification (e.g. lot date code) and quantity shipped.

- G) MANUFACTURING PROCESS CONTROL: All manufacturing processes shall be fully documented. EMCORE reserves the right to review and approve manufacturing documentation including SMT reflow oven profiles and set-ups.

Significant changes to manufacturing processes/documentation (used in the performance of this contract) shall not be made without prior EMCORE approval.

25.0 NADCAP

- A) Processor shall be an approved NADCAP (National Aerospace and Defense Contractors Accreditation Program) processor for all of the applicable platings (including underplatings), painting, surface finish or conditioning process.

Please note: Supplier is responsible for maintaining NADCAP accreditation. If this accreditation changes status at any time, Supplier is to notify Buyer within one week of the change (e.g. completion of re-accreditation, loss of accreditation or effectivity date changes).

26.0 DFARS, SPECIALTY METALS

- A) Supplier shall provide products and materials compliant to DFARS 252.225-7008 "Restriction on Acquisition of Specialty Metals" and 252.225-7009 "Restriction on Acquisition of Certain Articles Containing Specialty Metals" as applicable per the conditions & requirements of the clause.