

Quality Assurance Procurement Provisions

QUALITY REQUIREMENTS APPLICABLE TO L-3 COMMUNICATIONS – RUGGEDIZED COMMAND AND CONTROL SOLUTIONS (RCCS) PROCUREMENT

Quality requirements that must be complied with, in addition to those shown on the Engineering drawing, are listed by numbered paragraphs on Purchase Order with reference to this document.

1. GENERAL

INITIAL SHIPMENT Shipment against this purchase order **shall contain a copy of the manufacturer's specification, drawing, print, catalog page, or other description paper suitable to determine, in receiving inspection, that the part received is the part ordered. A published description of the part shall be shipped when detailed information is considered proprietary.**

REPAIRS Seller acceptance of artificial repair (i.e., welding, penning, etc.) or characteristics found to depart from requirements of seller, RCCS or RCCS customer designs or specifications will not be accepted by RCCS.

CORRECTIVE ACTION Prompt action shall be taken to detect and correct conditions, which have resulted or could result in the production of non-conforming articles. Seller's corrective action system shall cover all phases of manufacturing system activities from material procurement through delivery of articles to RCCS including corrective action with seller's suppliers.

CORRECTIVE ACTION REQUESTS When a quality problem exists, the buyer will request corrective action from the seller. Such requests require timely responses and should include the following information: Analysis of the cause of the problem, statement of the action taken, and the effectivity of the action. When corrective action is required for Government Source inspected items, the Supplier shall coordinate such action with the Government Quality Assurance Representative assigned to their plant. Seller shall respond within 30 days of being notified of a nonconformance to RCCS requests for reports describing action taken to correct the cause of deficiencies found in articles submitted to RCCS and to prevent their recurrence on subsequent deliveries. If the supplier cannot respond by the defined due date, a written request for extension must be submitted to the buyer.

REPLACEMENT OR REWORKED MATERIALS Replacement or reworked materials resubmitted by the seller, following RCCS rejection, must be segregated and shown as separate items on seller's shipping documents and certifications. Seller's shipping documents and certifications **must identify these items as "replacement" or**

"reworked" units, and must reference the number of the RCCS Non Conforming Material Report on which they were rejected.

QUALITY/ SYSTEM Compliance with the requirements of a quality system clause as specified (See Section 2) in no way relieves the seller of the final responsibility to furnish acceptable supplies or services. In the case of revisions to specifications governing quality systems, the latest revision in effect on date of invitation for bids shall apply. By reference in the applicable governing specification, the seller becomes the "contractor" or "supplier". The seller's quality system shall be subject to audit by RCCS representatives and/or representatives of the prime contracting agency.

MERCURY EXCLUSION The supplies furnished under this purchase order shall contain no elemental mercury or chemical or thermally unstable mercury compounds. The seller shall take reasonable precautions to ensure that supplies furnished under this purchase order are not contaminated with any type of mercury compounds. The requirement shall be included in all subcontracts, purchase orders and any other document used for procurement.

CERTIFICATIONS When certifications are required (See Section 4) the seller shall with each shipment furnish one legible and reproducible copy of a certificate containing a full and complete statement meeting the requirements of the specific clause and signed by a responsible representative of the seller. Where at all possible, the seller is encouraged to combine statements in one certificate to include the requirements of two or more clauses when more than one certification clause is specified. Records as objective evidence attesting to certifications required must be maintained on file at seller's facility subject to review by RCCS representatives and/or representatives of the prime contracting agency. Each certification shall reference the part number, serial number (if appropriate) and the RCCS Purchase Order number.

RECORDS/REPORTS Records and/or reports reflecting observance of inspection and test instructions must be maintained on file at the seller's facility subject to review by RCCS representatives and/or representatives of the prime contracting agency. When records or reports are required (See Section 5), the seller shall with each shipment furnish one copy of each record or report specified.



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RECORDS RETENTION ALL records including certifications as required under the terms of this purchase order and which documents the quality of the items provided shall be retained for a minimum of 4 years after the final shipment unless otherwise specified in the purchase order or the contract.

IDENTIFICATION/TRACEABILITY Seller shall identify parts/materials by name, part or code number, specification number, type, size, vendor name or logo and indication of acceptance, etc. Identification marking of parts/materials shall be in accordance with purchase order, drawing, and/or specification requirements. In the absence of specific marking requirements, marking will be accomplished by use of decal, rubber stamp, metal tag, etc. Where marking of individual items is not practical due to size, shape or deleterious effect, the identification data (including quantity) shall be marked on the smallest package of units packaged by the seller. This identification, including any special handling conditions, must be recorded on certifications to the parts/materials. Records of identification and traceability shall be maintained on file at seller's facility subject to review by RCCS representatives and/or representatives of the prime contracting agency.

MILITARY SPECIFICATIONS Any military specifications called out in this document shall be of the latest revision in effect on the date of the invitation to bid, unless otherwise specified.

SUPPLIER NONCONFORMANCES The seller is not authorized to perform repairs to the product or make "use-as-is" dispositions, which deviate, from the requirements of the drawing without the Buyer's prior written authorization. Acceptance of non-conforming parts is the prerogative of RCCS. Discrepant parts may be presented for consideration on a Supplier Disposition Request (SDR) form. SDR forms are available through RCCS Purchasing and must be returned to the cognizant buyer for MRB evaluation. The supplier is responsible for identifying the shipment of parts and their paperwork with the appropriate SDR number. The SDR shall be submitted in advance of shipping the parts. In some cases, it may be necessary for RCCS to request the shipment of one or more parts in order to evaluate the non-conformance. **A copy of the SDR is to be shipped with parts.**

RCCS SOURCE SURVEILLANCE All items covered by this purchase order may be subject to source surveillance by RCCS and customer quality representative. This will include surveillance of the seller's system, procedures, facilities and products. The seller shall at no additional charge supply inspection records and when specified perform or repeat under surveillance of the RCCS representative selected inspections and tests required by applicable drawings specifications and inspection instructions.

DESIGN CHANGES The supplier shall notify RCCS upon receipt of this order of any design changes to this product since buyer's last procurement that have been implemented or will be implemented prior to delivery on this order. Supplier shall notify buyer prior to incorporation of any subsequent design changes that will affect this order. Design changes include any change in the materials, processes and configuration that may affect the form, fit function, interchangeability or reliability of the product.

NOTIFICATION OF FACILITY CHANGE Seller shall not relocate any production, manufacturing and/or processing facilities during performance of the purchase order, without promptly notifying the buyer and affording the buyer an opportunity to examine such facilities for compliance with Quality Assurance requirements, including any necessary approvals.

PACKAGING FOR SHIPMENT Items require protection from physical and mechanical damage. Protection shall be by wrapping, cushioning, part compartmentalization, cartonizing or other means to mitigate shock and vibration during handling and shipment. Glass items such as displays or optical filters shall be packaged in shipping containers subject to buyer's approval.

ESD HANDLING AND PACKAGING Seller is required to use ESD protection when handling or testing ESD sensitive items in accordance with MIL-STD-1686, JEDEC 14, JESD 42, or ANSI / EIA-625. Unless ESD protective requirements are otherwise specified, items shall conform to the following:

All microcircuits shall be packaged in accordance with one of the following methods:

- Inside antistatic rails with conductive or antistatic plugs to prevent movement. Antistatic rails shall then be packed in a conductive field shielding material.
- Inside conductive rails, with conductive plugs to prevent movement. Conductive rails shall then be packed inside an antistatic or conductive material.

Semiconductor devices, Diodes, Transistors, Crystal Oscillators, Chip Capacitors, Chip and Fixed film Resistors shall be packed in accordance with one of the following examples:

- Part leads shall be pushed in noncorrosive, ESD foam and then placed into conductive shielding ESD bags.
- Parts placed in antistatic vials or containers, which provide physical separation, shall then be placed into a conductive shielding bag.

All static generating material such as common plastic bags wraps, envelopes, bubblepacks, foams, vials, cartons, or tote trays shall be eliminated from use as inner wrapping. Only conductive material shall be used.

Packaging material to fill voids or to provide physical protection shall be an antistatic dunnage material. Outer surfaces of the unit container shall have a caution and advisory label and shall be marked in accordance with MIL-STD-129.



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Unit packs will be marked with a sensitive electronic device symbol. When available marking space permits, the sensitive electronic device caution label may be used.

INTERMEDIATE AND EXTERIOR PACKS Intermediate and exterior packs shall be marked with a yellow (Pantone 803C) caution label having black lettering. A 2x2 inch label shall be placed on one side of each intermediate container. Two 4x4 inch labels shall be placed on each exterior container one on the identification marking side (or surface) and one on the opposite side of each shipping container exceeding 1/2 cubic foot. Smaller shipping containers shall be marked in the same manner except that the 2x2 label may be used in lieu of the larger one.

MOISTURE SENSITIVE COMPONENTS. Moisture Sensitive components shall be packaged in accordance with IPC/JEDEC J-STD-033.

RCCS OWNED TOOLING When tooling is manufactured by the supplier, as part of the purchase order, the supplier shall inform the buyer when tooling is complete. Procurement Quality along with the appropriate engineer, if required, will perform 1st article inspection on the tool or the first piece supplied off the tool.

Once the tool has been verified acceptable the supplier shall be responsible for proper storage, handling and preventive maintenance. The supplier shall inform the buyer of any defects in the tool that may cause the shipment of discrepant material. An annual inspection of the tool is required. The tooling number or RCCS's asset number will be added to RCCS's calibration recall system.

Tools that are RCCS owned and furnished to the supplier shall be annually certified by RCCS personnel. The supplier is responsible for proper storage; handling and preventive maintenance while the tool is at their facility.

2. QUALITY SYSTEM

- A MIL-Q-9858. The manufacturer shall implement and maintain a quality control system that complies with the requirements of Military Specification MIL-Q-9858, "Quality Program Requirements."
- B MIL-I-45208. The manufacturer shall implement and maintain an inspection system that complies with the requirements of Military Specification MIL-I-45208, "Inspection System Requirements."
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- F ISO 9001:2000 The manufacturer shall implement and maintain a quality system that complies with the requirements of International Standard ISO 9001:2000,

"Quality Management Systems Requirements". Suppliers qualified to this requirement shall remain so unless a new survey is performed or new information becomes available regarding the supplier.

- G ISO-9001. The manufacturer shall implement and maintain a quality system that complies with the requirements of International Standard ISO-9001, "Quality Systems-Model for Quality Assurance in Design/Development, Production, Installation and Servicing." Suppliers qualified to this requirement shall remain so unless a new survey is performed or new information becomes available regarding the supplier.
- H AS 9100. The manufacturer shall implement and maintain a quality system that complies with the requirements of AS 9100 "Quality Management System – Aerospace". Suppliers qualified to this requirement shall remain so unless a new survey is performed or new information becomes available regarding the supplier.
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- K RCCS APPROVED SYSTEM. The supplier shall provide and maintain an inspection system approved by RCCS, which includes: Materials traceability, inspection to demonstrate conformance to the product requirements and calibration of inspection equipment in accordance with ISO 10012-1 or ANSI Z540-1.
- L MINIMUM INSPECTION SYSTEM. The supplier shall provide and maintain a quality control system adequate to verify that the item(s) provided meet all the requirements of the Purchase Order. RCCS verification of item conformance will consist of a visual inspection for correct item(s), count and damage.
- M CALIBRATION SYSTEM REQUIREMENT. The suppliers calibration system shall comply with the latest revision of ISO 10012-1 or ANSI Z540-1.
- N STATISTICAL PROCESS CONTROL PROGRAMS.
 - a. The supplier shall implement and use statistical process control techniques in the manufacturing process to eliminate defective parts. A minimum program shall include training, identification of critical operations/parameters, noted measurement techniques and a control action system. The supplier must be prepared to submit a plan detailing their SPC program to RCCS upon request. The plan shall describe, in detail, what SPC data is collected and available for RCCS review and approval. This data shall include CPK values for variable data and evidence of 100% inspection for attribute data.
 - b. The supplier shall meet the requirements of the above Paragraph a. In addition; the supplier shall supply SPC charts/data generated during this production lots fabrication. Final acceptance of this product is contingent upon review and approval of the data submitted to RCCS.
 - c. The supplier shall implement and use statistical process control techniques in their manufacturing processes. The SPC program shall be developed and maintained in accordance with the requirements of EIA-557.



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3. INSPECTION/SURVEILLANCE

A RCCS SOURCE INSPECTION RCCS inspection/test of products/services is required at your facility prior to each shipment. A five (5) day notice shall be furnished to RCCS regarding the seller's plans for incoming, in-process, final assembly inspection/test of products or services to permit RCCS to schedule each inspection. The seller shall furnish reasonable access to relevant contract, design and specification data, and necessary equipment and space to perform such inspection/test unless otherwise waived by RCCS. Evidence of source inspection, or waiver must be shown on or accompany the shipping document.

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C GOVERNMENT SOURCE INSPECTION

a. Government inspection is required prior to shipment from your plant. Upon receipt of this order, promptly furnish a copy to the Government representative who normally services your plant; if there is no government representative then send a copy to the nearest Army, Navy, Air Force or Defense Supply Agency inspection office, so that appropriate planning for government inspection can be accomplished. In the event the representative or office cannot be located, our purchasing agent should be notified immediately.

For shipments made directly to RCCS the Government Representative will perform the necessary Product Quality Audit (PQA) actions and indicate these actions by annotating the suppliers shipping document/packing list:

1. "Required PQA of listed items has been completed." Date
2. Signature of Government Representative and/or Department of Defense Acceptance Stamp imprint.
3. Typed name of Government Representative at RCCS.

b. During the performance of this purchase order, your quality control 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 you are otherwise notified. You shall provide a copy of this purchase order to your Government Representative upon his request.

D FIRST PIECE The first piece(s) produced shall be submitted to and inspected and accepted by RCCS Quality Assurance **prior to further production**. Compliance

with requirements will be determined by inspection of one part to applicable drawings and specifications, unless more than one part is specified on the purchase order. When submitted to RCCS, first piece items shall be accompanied by the seller's first item inspection report. First pieces shall be tagged or otherwise identified to show the tool number and tool serial number when applicable.

E RCCS PRE-CLOSURE (PRE-CAP) Inspection at supplier's facility is required.

F RCCS SOURCE PRIOR TO PAINT Source inspection of this part is required prior to applying paint. This may be caused by the dimensions of the part applying to paint or other requirements as defined by the drawing. A five (5) day notice shall be furnished to RCCS to permit RCCS to schedule each inspection. The seller shall furnish reasonable access to relevant contract, design and specification data, and necessary equipment and space to perform such inspection/test unless otherwise waived by RCCS. Evidence of source inspection, or waiver must be shown on or accompany the shipping document.

G RCCS SOURCE PRIOR TO DIP BRAZE Source inspection of this part is required prior to dip brazing the part. A five (5) day notice shall be furnished to RCCS to permit RCCS to schedule each inspection. The seller shall furnish reasonable access to relevant contract, design and specification data, and necessary equipment and space to perform such inspection/test unless otherwise waived by RCCS. Evidence of source inspection, or waiver must be shown on or accompany the shipping document.

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K FIRST PIECE INSPECTION **With the first lot of deliveries**, the Seller shall submit the first piece to the Buyer's Receiving Inspection Department together with documents including ECN/ECO changes showing data representing results of Seller's first article/test inspection, including actual dimension or value for each specified characteristics. If an ECN/ECO is implemented that affects the original first article data, the seller shall submit first article/test inspection data only for those affected characteristics with the next delivery of parts. If a first article inspection report was submitted under a previous purchase order and it has been greater than six months since the last delivery of product, the seller shall submit a new first article inspection report to the buyer. If the manufacturing process has changed, i.e. fixturing, laser cut to sheet metal punch, hogout to a welded part, the seller shall submit a new first article inspection report to the buyer.



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- L INSPECTION AND TEST PLAN/CONTROL PLAN The Seller shall prepare an inspection/test and/or control plan for the items delivered under this purchase order. The plan shall contain a flow chart, which depicts the operational sequence and inspection/test points in relation to procurement, manufacture, assembly, acceptance, and delivery. A copy of the plan shall be submitted a minimum of thirty days prior to the first delivery. The control plan shall contain all significant processes and test parameters as identified by the Seller, **as well as any special tools, test equipment and inspection gages that will be used.** The required elements of the control plan are a process flow. A brief description of each process step, the process parameter and product characteristic for the process step, the monitoring methods, the analysis method or specific statistical tool to be used to control the process, and reactions if out-of-control conditions are to be encountered.
- M ACCEPTANCE TEST PROCEDURE Seller shall prepare an acceptance test procedure for the items to be delivered under this purchase order, to include, as a minimum, the equipment, sequence, and steps necessary to perform the acceptance test. The procedure shall contain a requirement for recording, as a minimum, the following data (for submission to Buyer): Part number, part name, revision letter, purchase order number serial / lot number, sequence number, criteria measured or tested test results, test data, and signature of Seller's Inspection Representative. A copy of the acceptance test procedure shall be submitted for Buyers Procurement Quality Engineer/Assurance approval at least thirty (30) days prior to performance of the initial acceptance test. If an acceptance test procedure was submitted under a previous purchase order and it has been greater than six months since the last delivery of product, the seller shall submit the current revision of the Acceptance Test Procedure to the buyer.
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- O MONTHLY TEST DATA The seller shall maintain a continuous log of all units that are processed through test. This log shall include the results of all tests of the end item (including ESS). A written record shall be maintained of all failures that occur while performing these tests. On a monthly basis, the test data (including the failure data) shall be submitted to the buyer in a pass/fail report for each test type for each part number covered by this purchase order.
- P STATISTICAL PROCESS CONTROL DATA
- a. The Seller shall provide Statistical Process Control (SPC) charts (X and R charts) with delivered hardware for all critical and major characteristics (as identified by the Seller and concurred with by the Buyer or Buyer's purchase order). The charts shall be submitted to the Buyer following the completion of the affected operation for the individual lots. An additional chart shall be submitted to illustrate the variability between the current lot and previously produced lots. A copy of all the charts must be submitted with the hardware delivery, and the Buyer reserves the right to review the charts prior to delivery.
- b. The Seller shall provide individual charts or Run charts with delivered hardware for all critical and major characteristics (as identified by the Seller and concurred with by Buyer or Buyer's purchase order). The charts shall be submitted to the Buyer following the completion of the affected operation for the individual lots. An additional chart shall be submitted to illustrate the variability between the current lot and previously produced lots. A copy of all the charts must be submitted with the hardware delivery, and the Buyer reserves the right to review the charts prior to delivery.
- R SUPPLIER REPAIR REPORT The supplier shall provide a **repair report** of each item returned for rework or replacement. The supplier shall provide a description of the rework/repair required when returning the assembly to the operational requirements of the procurement specification. A list of all replaced electronic components including: part number, and probable cause of the failure mode is required. If the failure cannot be verified, the test methods used will be summarized. The supplier shall have 30 calendar days from the time the parts are received at their facility to return repaired or replacement parts to the buyer along with the repair report.
- S SUPPLIER FAILURE ANALYSIS REPORT The supplier shall provide a **failure analysis** of each item returned for rework or replacement. The supplier shall provide a detailed root cause analysis of the failure down to the component part. If the failure cannot be verified, the test methods used will be summarized. A copy of the failure analysis shall be forwarded to the buyer upon completion and a copy shall also be included with the part when it is returned.
4. CERTIFICATIONS
- A COMPLIANCE WITH PURCHASE ORDER REQUIREMENTS The seller shall certify compliance with all requirements of the purchase order (including all referenced documents such as drawings and specifications). The statement shall identify the parts and/or materials certified and shall include all serial numbers for



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serialized parts or lot numbers for items identified by lot number, and shall contain the applicable RCCS purchase order number and quantity included in the shipment. The certification must be signed and dated by an authorized employee.

- B CERTIFICATION OF PRINTED WIRING BOARDS Certification shall include a minimum of one coupon for each lot identified by lot number. The requirements of IPC 2221, MIL-PRF-31032, IPC-A-600 and J-STD-003 shall be as indicated on the purchase order.
- C MATERIAL CONFORMANCE The seller shall certify items on the purchase order were produced from material furnished by RCCS or from material obtained by the seller. The seller must maintain on file specific data or other objective evidence. To the effect that the seller supplied material conforms to all drawing and specification requirements. The applicable drawings and/or specifications shall be listed, including revision letters or numbers.
- D QUALIFIED PRODUCTS FROM MANUFACTURER OR DISTRIBUTOR ON QUALIFIED PRODUCTS LIST Manufacturer's or distributor's name and the commercial designation of the product must appear on the parts, affixed by label or nameplate, preprinted on the wrapping, or on an accompanying certification.
- E QUALIFIED PRODUCTS FROM SUPPLIER NOT ON QUALIFIED PRODUCTS LIST Certification containing the following statement or equivalent: "Seller hereby certifies that (product designation or part number) shipped to RCCS under (purchase order number) has been qualified by (manufacturer's name) under referenced test (number) and QPL (number). Manufacturer's certification is on file at seller's facility."
- F QUALIFIED PRODUCTS INCORPORATED INTO A PRIME ITEM Certification containing the following statement or equivalent: Seller hereby certifies that the following subsidiary item (list the QPL products involved, QPL reference numbers, and manufacturer's name and designation) which are incorporated into the prime item (list prime item part number and purchase order number) are QPL products in accordance with qualification tests. QPL item manufacturer's certification (or certification from seller's supplier) is on file at seller's facility."
- G AGE SENSITIVE MATERIALS WITH SHELF LIFE REQUIREMENTS
- a. Age Sensitive Certification. The seller shall certify that the item on the purchase order is age sensitive. The certificate must identify the material and specify the cure date or date of manufacture, the expiration date and special storage and handling requirements.
- b. Elastomeric Material Data/Statement. The seller shall provide a statement or data sheet separate from the packing slip that identifies the material, specifies the batch number, cure date, date of manufacture and shelf life.
- H SPECIAL PROCESSES The seller shall certify processes covered by RCCS, seller or Government specification, such as but not limited to soldering, radiography, welding, heat treating, cleaning, electroplating, anodizing, chemical films, and nondestructive testing were performed in accordance with specification requirements. The certificate shall identify the items processed, the RCCS purchase order number, and the applicable specifications (including revision letters or numbers) to which the processes conform and the date and the name of the agency that performed the process if other than the seller.
- I FUNCTIONAL TEST The seller shall certify that the items on the purchase order were functionally tested (e.g., mechanical, hydraulic, or electronic operation) to assure conformance to purchase order, drawing, and specification requirements. The certificate must reference applicable specifications (including revision letter or numbers) and must state the functional test reports, which provide objective evidence of conformance to specified requirements, are on file at seller's facility.
- J PACKAGING The seller shall certify that the items on the purchase order have been packaged in accordance with the applicable packaging specifications and requirements stipulated on the purchase order. The certificate must include the date of packaging, the name of the packaging agency if other than seller, and signature of a responsible representative of the packaging agency.
- K FLEXIBLE AND RIGID FLEX PRINTED WIRING The seller shall certify that all flexible and rigid flex printed wiring meet the requirements of MIL-PRF-31032. The seller shall submit a minimum of one coupon for each rigid flex PWB lot. Solderability shall be per J-STD-003
- L SOLDERABILITY OF EXTERNAL LEADS AND TERMINALS The seller shall certify the components and parts, and all terminals meet requirements of ANSI/J-STD-001 and the solderability tests specified in MIL-STD-202, Method 208, or MIL-STD-750, Method 2026, or MIL-STD-883, Method 2003 or J-STD-002.
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S CERTIFICATION OF CHEMICAL/PHYSICAL PROPERTIES The supplier shall ensure that the material used to complete this purchase order has had appropriate verification of physical and chemical properties and that these properties are in agreement with the material required by RCCS for this order. Such verification usually includes determination of physical properties such as tensile and yield strengths and elongation. Chemical properties would include percentage composition of the various elements in the material such as silicon, lead, nickel, iron, carbon, copper, etc. The supplier shall obtain the Certified Test Reports of Chemical and Physical properties and shall ensure that the reports are identifiable to the raw material used to complete this purchase order. The supplier shall maintain on file and have available as required by RCCS, the certified Chemical and Physical Properties Test reports covering the raw material used to complete this purchase order.

T MATERIAL TEST REPORTS The seller shall provide a laboratory test report with each shipment that verifies the material supplied is in complete compliance with the applicable RCCS specification. This report shall identify the RCCS part number and any traceability data, i.e. batch number, etc.

U PAINT CERTIFICATION With each shipment, the supplier shall provide written certification documenting that the painting was performed in accordance with the drawing and Purchase Order requirements. The facility actually performing the painting shall prepare the certification. Actual paint thickness shall be recorded on the paint certification.

5. RECORDS/REPORTS

A INSPECTION Visual and dimensional observations and results during component, in-process and assembly operations must be performed. Records of these observations shall as a minimum describe the:

- Product inspected and the number of the drawing/specification used.
- Acceptance limits of the observation (Characteristic).
- Number of observations made.
- Method and equipment used for inspection.
- Number of deficiencies detected.

f. Identity of individuals performing observations and date.

These records/reports shall be maintained by the supplier unless instructed to do otherwise by the buyer.

- B TEST Electrical, functional, environmental, mechanical or other tests in part or whole must be performed. Records of these tests shall as a minimum describe the:
- Identity of the test with this contract.
 - Product tested and the number of the drawing / specification used.
 - Acceptance limits of the test parameters.
 - Number of units and test performed.
 - Method and equipment (including accuracy and range) used.
 - Actual test results.
 - Number and nature of failures (if any) encountered.
 - Signatures of individuals performing / observing the test and date.

These records/reports shall be maintained by the supplier unless instructed to do otherwise by the buyer.

Documentation provided to RCCS with the shipment of ICs must list the tests performed to Method 5004 of MIL-STD-883 and results (Group A Summary).

- C CHEMICAL / PHYSICAL Actual results of chemical or physical tests conducted on materials submitted must be provided. Reports shall identify material specification and revision, a test conducted and results, and material lot utilized. Mill reports are satisfactory, provided they are endorsed by a responsible supplier representative and are positively identifiable to the lot furnished.

- D CALIBRATION Instrument, gage, tool or equipment calibration reports must be provided. Report must include:

- Identification of item calibrated.
- Identification of the calibration standard and procedure employed.
- Degree of non-conformance (percent out of tolerance).
- Results of inspection for damage or condition hazardous to the accuracy integrity of the item the item.
- Results of calibration.
- Name of the calibrating agency.
- Identity of individuals performing calibration.
- Certifying statement that the standard used for calibration bears evidence of current traceability to the National Institute of Standards and Technology.
- Date of calibration.



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- j. Signature of a responsible representative of the calibrating agency.
- k. "As received" calibration data.

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F INSPECTION / TEST REPORT The Seller shall submit with each shipment a report for the delivered end items or assemblies with the following information included as a minimum:

Nomenclature
Purchase Order number
Part number
Revision letter
Lot number, Lot quantity
Inspection sample size of less than 100%
Characteristics/parameters inspected and/or tested
Inspection test data
Quantity passed/rejected by characteristic
Date of inspection/test
Signature of Seller's Inspection/Test Representative

6. IDENTIFICATION

- A MANUFACTURING LOT OR BATCH NUMBER Seller shall identify all parts and/or material with a manufacturing lot number or batch number. **NOTE:** In the absence of a lot control specification required by this purchase order, a lot or batch shall be defined as parts or materials produced by one manufacturer in one unchanged process in accordance with the same drawing and/or specification.
- B TRACEABILITY Material used must be identified by lot number, serial number, material type, specification and applicable change letter or number, heat number, etc., and traceable to records of acceptance. Parts fabricated by the seller shall be identified to the lot of materials used. When two or more parts are joined in an assembly, seller shall prepare an assembly parts list identifying each part in the assembly by part number and serial number, and the lot number of material from which fabricated if fabricated by the seller, or lot control number when the part is a purchased item. For raw materials, this clause applies to identification and traceability of materials to heat or lot number, manufacturing and inspection processes, test results and records of acceptance. Conformance by seller's suppliers to traceability requirements of the purchase order, drawing, and / or specifications, shall be the responsibility of the seller.

C AGE SENSITIVE MATERIAL IDENTIFICATION Seller shall identify all age sensitive parts and/or materials, i.e., items having characteristics susceptible to quality degradation with age such as but not limited to all military parts and components (i.e., ICs diodes, transistors, etc.), all protective coatings, rubber, synthetic rubber, adhesives, resins, plastic/base paints, elastomers, etc. Age sensitive items must be marked in such a manner as to indicate the date at which the critical life was initiated and when the useful life will be expended (i.e., shelf life expiration). Rubber and synthetic rubber shall be less than **4 quarters old** when received at RCCS. All other material and parts that have a limited shelf life shall have, at the time of receipt at RCCS, a minimum of seventy-five (75) percent of the shelf life remaining. Age sensitive material shall be packaged and shipped in a manner that it satisfies temperature requirements.

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E DATE CODE CONTROL
RCCS requires date code to be no more than 3 years old at the time of delivery.

F SERIALIZATION

- a. The Supplier shall assign serial numbers to those end items being purchased by this purchase order. No two parts having the same part number are to be identified with the same serial number. The manufacturing date code may be a part of the serial number.
- b. Seller to provide a list of serial numbers included in shipment. If the deliverable is an assembly, all subassembly serial numbers along with the assembly serial number shall be provided.
- c. When bar coded, serial numbers have been applied to the hardware by the manufacturer, the manufacturer shall provide a separate sheet attached to the packing slip with the serial numbers of the units being delivered. This information shall be provided in the same bar code format that is used on the delivered hardware.
- d. The supplier shall use bar coded serial numbers to satisfy the serial number requirement of the drawing. The bar code format shall be Code 39.

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8. PACKAGING FOR SHIPMENT

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- B PAINTED PART SURFACES Painted surfaces must be protected by paper if wrapped in plastic or bubble wrap.
- C FLEX CIRCUITS Flex circuits must be packaged between two pieces of cardboard and wrapped in bubblewrap.
- D ESD FOAM ESD foam must protect connector pins.
- E INDIVIDUAL PACKAGING Parts must be delivered using individual packaging.

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10. MARKING

- A SPECIFICATION / SOURCE CONTROL DRAWING.
 - a. Specification Control Drawing: Parts must be marked with the manufacturer's name/CAGE code number, part number, date code and the RCCS part number.
 - b. Source Control Drawing: Parts must be marked with the manufacturer's name/CAGE code number, part number, date code and be bagged and tagged with the appropriate RCCS drawing number. Prior to shipment when not defined by drawing the packing slip must reference the appropriate manufacturer's part number and RCCS source control drawing number.
- B DELETED
- C SCREENING Parts furnished under the referenced specification must comply with the source control drawing requiring additional screening by the manufacturer or a qualified independent test facility. Parts must be marked with manufacturer's name; CAGE code number, index point and date code and with the RCCS specification part number if required on the drawing.

11. WORKMANSHIP

- A J-STD-001, Requirements for Soldered Electrical and Electronic Assemblies. The manufacture shall be responsible for maintaining certified personnel, facilities, procedures and materials in accordance with the latest revision of J-STD-001, **Class 2** unless otherwise specified by the drawing.
- B J-STD-002, Solderability Tests for Component Leads. The manufacture shall be responsible for maintaining certified personnel, facilities, procedures and materials in accordance with the latest revision of J-STD-002.

Requirements for Solderability Tests for Components Leads, Terminations, Lugs, Terminals and Wires.

- C J-STD-003, Solderability Tests for Printed Boards
The manufacture shall be responsible for maintaining certified personnel, facilities, procedures and materials in accordance with the latest revision of J-STD-003.
- D IPC-A-600, Acceptability of Printed Boards
The manufacture shall be responsible for maintaining certified personnel, facilities, procedures and materials in accordance with the latest revision of IPC-A-600.
- E IPC-A-610, Acceptability of Printed Board Assemblies
The manufacture shall be responsible for maintaining certified personnel, facilities, procedures and materials in accordance with the latest revision of IPC-A-610, **Class 2**.
- F MIL-HDBK-454, General Requirement for Electronic Equipment
The products supplied on this order shall comply with the general requirements of MIL-HDBK-454, including workmanship and soldering requirements 5 or 9 as specified in the RCCS specification or drawing. The supplier shall maintain appropriate controls to ensure that acceptable workmanship and quality levels are met.
- G MIL-STD-2000, Requirements for Soldered Electrical and Electronic Assemblies
The manufacture shall be responsible for maintaining certified personnel, facilities, procedures and materials in accordance with MIL-STD-2000.
- H WS6536 The manufacture shall be responsible for maintaining certified personnel, facilities, procedures and materials in accordance with WS6536.
- I J-STD-001, Requirements for Soldered Electrical and Electronic Assemblies.
The manufacture shall be responsible for maintaining certified personnel, facilities, procedures and materials in accordance with the latest revision of J-STD-001, **Class 3**. The manufacturer further agrees to submit to RCCS surveys/audits to verify compliance.
- J IPC-A-610, Acceptability of Printed Board Assemblies
The manufacture shall be responsible for maintaining certified personnel, facilities, procedures and materials in accordance with the latest revision of IPC-A-610, **Class 3**. The manufacturer further agrees to submit to RCCS surveys/audits to verify compliance.



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K. Unless otherwise specified on the master drawing, Manufacture shall be in accordance with MIL-P-55110 or MIL-P-50884.

L. Process Control Plan Approval

Product delivered under this order must be fabricated under a RCCS Supplier Quality Assurance approved Process Control Plan in accordance with ANSI J-STD-001, Class 3 requirements. A copy of the plan and flow depicting the entire process control sequence, data collection points, total opportunity counts, identified defect/process indicators and process improvement strategies must be received for review prior to beginning production. Forward all changes to RCCS for approval.

M. IPC-6012, Rigid printed wiring boards shall meet the requirements specified in IPC-6012. Printed circuit boards shall be etched back for removal of resin and glass fibers from internal conductors prior to plating in accordance with 3.6.2.5 of IPC-6012.

12. SOFTWARE/FIRMWARE CONTROL SYSTEM The supplier shall provide and maintain a software/firmware control system, which assures that the items supplied are in conformance with RCCS configuration requirements. The system shall ensure that:

- A The software is uniquely identified by (number, date, revision letter, etc.) to the configuration of the items supplied.
- B Any RCCS-directed changes to the items being supplied are reviewed for impact on the current software configuration and that any changes required are appropriately made.
- C Any supplier-initiated changes following RCCS acceptance of the initial lot shall have no impact on the item(s) form fit or function, unless specifically authorized by RCCS in writing.
- D Generation and maintenance of software system and detailed design documents.
Utilization of control software design file.
Indication of software validation plan.
Generation and submittal of a software validation plan.
Demonstration of the validation plan.
Provide for software configuration management per MIL-STD-480.
Initiation of software change traceability from the first formal release.
Implementation of a closed loop corrective action system.

- E ISO 9000-3
- F ISO 12207
- G MIL-STD-498

13. PERMANENCY OF MARKING

- A The marking on items supplied (i.e., part number, cage code number, date code, etc.) shall meet the marking permanency requirements of the applicable specification. To meet these requirements the use of permanent, non-conductive, epoxy-based inks is preferred. The test methods of "Resistance to Solvents" namely, MIL-STD 202, Method 215; MIL-STD-750, Methods 1022; or MIL-STD-883 Method 2015, shall be applied when required by the governing procurement specification/document.
- B For those RCCS items for which no permanency of marking specifications have been indicated the supplier shall use MIL-STD-130.

14. HAZARDOUS MATERIAL

- A Packaging of all Hazardous Material delivered to this purchase order shall comply with the Specific Packaging Requirements.
- B Deleted
- C CFC Free Products. The use of Ozone Depleting Chemicals (ODC's) in the processing of materials or products delivered on this order is not allowed. If the product requires the use of ODC's, this must be brought to the attention of the RCCS buyer prior to any such processing. The notification to RCCS must include the reason that alternative chemicals or processing cannot be substituted for ODC usage. Written authorization from RCCS is required prior to processing products for this order with ODC's. This requirement must imposed on any subtier supplier or processor utilized in the production of this order.

15. DRY BAG Parts shall be packaged within a heat-sealed bag with a desiccant and an indicator.



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16. **DESIGN OF PRINTED CIRCUIT BOARDS.** PCB design shall comply with RCCS Engineering Work Instruction CE-730-06-105, Printed Wiring Board Design Requirements.
17. **ELECTRONIC DATA INTERFACE** The supplier shall have the capability of accepting Engineering requirements using electronic data files. The supplier shall have the capability of using the electronic data files for purposes of machining and must be able to perform inspection using electronic data files.
- A DELETED
- B DELETED
- C **Verification of Solid Model Based Dimensions**
The supplier shall demonstrate conformance of the items produced to RCCS supplied design files and is responsible for supplying parts in compliance with the purchase order. The supplier shall demonstrate by an inspection process (CMM or equivalent) that all design features contained in the electronic solid model database files are present in the product presented to RCCS for acceptance.
The supplier shall create a "road map" from the solid model file that identifies feature and critical dimensions, drawing notes and default tolerance values as measured from "datums" referenced on minimally dimensioned prints and recorded in the CMM output report. This will be verified by RCCS inspection.
18. **LEAD FREE COMPONENTS** The supplier shall identify on the outside packaging all components considered to be lead free. The packages shall be identified with a label stating "Pb-Free", or be identified with a Pb-Free symbol, or some other equivalent identifier.
19. **PARTS SUBSTITUTIONS** Where components, as defined by the RCCS drawings, become unavailable due to compliance to the lead free legislation or other reasons, the supplier must request permission to use an alternative part before proceeding with the manufacturing assembly. Additionally, Buyer **requires** that any process changes, material content changes or any part substitution, **must receive written authorization** from Buyer prior to shipping. Furthermore, Buyer requires that Seller, Seller's Subcontractors or the OEM, **certify and guarantee in writing**, that the new part be form, fit and functionally equivalent to all of the technical specifications of the original part that Buyer has purchased per released drawings. For any contract violations, Buyer reserves its rights under law, including but not limited to claims for consequential damages.
20. **BGA X-RAY's** The supplier shall deliver with each shipment, a copy of the x-ray showing the solder workmanship Quality of each BGA installed. This data can be submitted on electronic media or can be submitted as a hard copy.
21. **Display Assembly Defect Mapping**
The supplier shall submit with each part a defect map (FORM-PQE-740-03-503) to document debris and blemishes found in the glass. The requirement for debris or blemishes is specified on the drawing or in the specification. Mark the location of all defects on the Cartesian Coordinate Map (FORM-PQE-740-03-504) (Ex. 1 B5-Bubble .007" Dia., Ex. 2 A2-3-Scratch W-.002xL.030). Record all defects except those that the drawing or specification identifies to ignore. Unless otherwise specified on the drawing or specification, all visual inspection for detection of defects shall be performed using a viewing distance of 12 +/-2 inches with an unaided eye. A magnifying eyepiece may be further used only to classify the nature of the defect observed with the unaided eye.