

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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1 QUALITY ASSURANCE/CONTROL SYSTEMS

1B AIRWORTHINESS PROCUREMENT

Revised September 3, 2013 (Clarified title)

Procurement of parts (including rework/repair activities) shall be from one of the following sources:

- a) Original Equipment Manufacturers (OEM).
- b) OEM Equipment Manufacturer approved distributors.
- c) Manufacturing organizations with approval from an appropriate regulator.
- d) Transport Canada (TC) approved distributors.
- e) Aviation Suppliers Association (ASA) accredited distributors.
- f) Maintenance organizations with approval from an appropriate regulator.
- g) Independent distributors where these organizations supply only approved parts.
- h) Suppliers utilized for repair and/or manufacture as directed by the authorized program assigned Design Engineer (DE).

Note 1: All procurement sources need to be approved and listed in the SQD in accordance with OP 510.

Note 2: All suppliers performing airworthiness functions need to be assessed by the authorized program DE and included in the L-3 ESS Design Support Network (DSN).

1F CALIBRATION SYSTEM (ISO 10012, ISO 17025, ANSI Z540-1)

Revised February 21, 2002 (ISO 17025 added)

Measuring and testing equipment used in the performance of verifying the compliance of this commodity with the PO and specification requirements, shall be subject to a calibration system that conforms to the current requirements of the applicable calibration system.

1G U.S. GOVERNMENT PROPERTY: SUBCONTRACTOR RESPONSIBILITY

Revised August 29, 2013 (removed FAR date)

The assets as provided in this Purchase Order are U.S. Government Property and as such the requirements of FAR 52-245-1 apply.

Use of the property is only as described in the Purchase Order.

The subcontractor is liable for loss, damage or destruction of the property;

All incidents of loss, damage or destruction will be promptly reported to L-3 ESS;

The subcontractor shall perform physical inventories of all L-3 ESS supplied U.S. Government Property annually, as requested, and will provide the written results of those inventories to L-3 ESS;

Subcontractors shall identify all US Government property while on their premises with markings "U.S. Government Property" and segregate from non U.S. Government property.

Removed material (including scrap and unserviceable components) from assets must be identified and controlled as US Government property while in the Subcontractor's stewardship.

All U.S Government Property (Removed material and assets) must be returned to L-3 ESS, unless otherwise directed by Procurement in writing.

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1H SOURCE CONTROL REQUIREMENT

Revised August 29, 2013 (included whimis suppliers and clarified title)

This commodity shall be procured and/or manufactured (as applicable) from a source directed in the applicable design authority drawing, specification, approved vendor list, or WHIMIS database.

The supplier from which the part is procured must also be listed in the L-3 ESS list of approved suppliers (SQD).

1J QUALIFIED PRODUCT LIST (QPL)/QUALIFIED MANUFACTURERS LIST (QML)

Revised March 14, 2002 (QML added)

This commodity shall be manufactured and controlled by a supplier who has been qualified by the U.S. Government and is currently listed in the applicable QPL and/or QML.

1K SOFTWARE QUALITY ASSURANCE PROGRAM REQUIREMENT (DOD-STD-2168, 498, ISO 12207, OR AS 9006)

Revised May 16, 2008 (added DOD-STD-498, ISO 12207 and AS 9006)

The software requirements of the subject order shall be in accordance with a software quality assurance system that conforms to DOD-STD-2168, DOD-STD-498, ISO 12207, or AS 9006. Reference: L-3 ESS SQD.

1M ELECTROSTATIC DISCHARGE CONTROL PROGRAM FOR PROTECTION OF ELECTRICAL, ELECTRONIC PARTS, ASSEMBLIES AND EQUIPMENT (MIL-STD-1686/MIL-HDBK-263, ANSI/ESD S20.20)

Revised May 16, 2008 (simplified)

The supplier shall establish and implement an electrostatic discharge control program for any activity that designs or handles electrical/ electronic parts susceptible to damage caused by static electricity in accordance with the applicable ESD program.

1R QUALITY SYSTEMS (ISO 9001)

Revised May 16, 2008 (minor changes, no change in content)

This commodity shall be manufactured and controlled by a supplier who has been approved by L-3 ESS and/or certified by an accredited registrar to the current requirements of ISO 9001. "Quality Management Systems - Requirements".

Reference: L-3 ESS SQD.

1V PROCUREMENT TO NON-RELEASED DOCUMENTATION (L-3 ESS INTERNAL USE ONLY)

Revised May 16, 2008 (minor grammar changes, no change in content)

This commodity is being procured to "non-released" documentation. Upon receipt of product at L-3 ESS, Supplier Quality Assurance (SQA) shall inspect/test the product to the released documentation. The product shall be held in SQA until released documentation is available. In urgent circumstances, the product may be inspected/ tested to the non-released documentation and/or allowed to proceed in a controlled manner per L-3 ESS positive recall system until documentation is released by Configuration Management..

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1W PROCUREMENT FROM UNAPPROVED SUPPLIER (L-3 ESS INTERNAL USE ONLY)

Revised Aug 29, 2010 (requirements clarification)

This product is being procured from an "unapproved" source and shall be held in SQA until the supplier/product is evaluated, inspected, and accepted. QAP 1W is normally applied for "one time only" procurement.

For the purpose of the evaluation, the product may be allowed to proceed in a controlled manner per L-3 ESS positive recall system until the evaluation/inspection is completed.

1Y QUALITY SYSTEMS (SAE AS9100)

Revised May 16, 2008 (corrected AS9100 title)

This commodity shall be manufactured and controlled by a supplier who has been approved by L-3 ESS and/or certified by an accredited registrar to the current requirements of SAE AS9100. "Quality Management Systems-Aerospace-Requirements".

Reference: L-3 ESS SQD.

1Z CUSTOMER FURNISHED MATERIAL

Issued July 10, 2002

L-3 ESS shall maintain traceability, verify, protect and safeguard property provided for use or incorporation into product. If any customer property is lost, damaged or otherwise found to be unsuitable for use, this shall be reported to the customer and records maintained. This does not absolve the customer from supplying compliant material.

2 SOURCE INSPECTION

2A GOVERNMENT SOURCE INSPECTION.

Government source inspection is required prior to shipment from the supplier's plant. Upon receipt of this purchase order (PO), the supplier must promptly notify the government quality assurance representative who normally services this supplier's plant and supply this representative with a copy of this PO so that appropriate planning for inspection can be accomplished.

2B SOURCE INSPECTION

Revised May 16, 2008 (changed title and combined with 2D)

All applicable items covered by this PO are subject to the successful completion of inspection at the manufacturer's plant, witnessed by L-3 ESS and/or L-3 ESS customer, as applicable. The manufacturer/supplier shall furnish, at no additional cost, the necessary facilities and equipment, and perform tests as required by L-3 ESS, to demonstrate conformance to the PO and referenced documents. Evidence of completion of source inspection shall accompany each shipment.

To arrange for source inspection, the supplier shall give L-3 ESS procurement department five (5) working days prior notification that the product is ready for source inspection. The supplier shall be notified by L-3 ESS within the granted five (5) working days whether to ship or hold for source inspection. If source inspection is waived, a written statement shall accompany the subject shipment to that effect along with the date and name of the person, at L-3 ESS, authorizing shipment.

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2C PRE-SEAL/IN-PROCESS VISUAL SOURCE INSPECTION

Revised May 16, 2008 (minor changes to title)

All applicable items covered by this PO are subject to the pre-seal/in-process source inspection at the manufacturer's plant, witnessed by L-3 ESS personnel. The manufacturer/supplier shall furnish, at no additional cost, the necessary facilities and equipment, and perform tests as required by L-3 ESS, to demonstrate conformance to the PO and referenced documents. Evidence of completion of source inspection shall accompany each shipment.

To arrange for source inspection, the supplier shall give L-3 ESS procurement department five (5) working days prior notification that the product is ready for source inspection. The supplier shall be notified by L-3 ESS within the granted five (5) working days whether to ship or hold for source inspection. If source inspection is waived, a written statement shall accompany the subject shipment to that effect along with the date and name of the person, at L-3 ESS, authorizing shipment.

2F L-3 ESS OWNED TOOLING

Revised May 16, 2008 (minor changes to title)

The supplier is responsible for the protection, calibration, maintenance and care, other than normal wear, of all L-3 ESS tooling and equipment in their possession. The tooling must be permanently marked with the part number, tool number and the phrase "Property of L-3 Communications Electronic Systems Inc.". Said tooling or equipment shall be subject to periodic inspection upon notice and shall be returned in an acceptable condition upon demand or notice.

2G L-3 ESS SUPPLIED MATERIAL

Revised May 16, 2008 (minor changes to title)

All L-3 ESS supplied material shall be supplied free issue and will have been approved by L-3 ESS Quality Assurance Department. L-3 ESS assumes responsibility for all material supplied except where damage is caused by the vendor due to mishandling or negligence while in the vendor's possession. A release note must accompany each shipment and shall include a statement to the effect that all components used in the manufacture of these assemblies were supplied by L-3 ESS.

2H L-3 ESS PREFERRED SUPPLIER STATUS

Revised May 16, 2008 (completely revised)

This product is procured from a supplier who has attained a preferred supplier status by consistently maintaining their performance above the L-3 ESS minimum quality requirement as documented in the applicable procedures. The preferred supplier status will be indicated in the L-3 ESS Supplier Quality Directory (SQD).

2J DROP SHIPMENT

Revised November 21, 2011 (change from casting drop shipment to generic drop shipment))

All material, designated on the PO for drop shipment to a third party, shall be inspected/tested by the supplier representative to all specification requirements and / or criteria agreed upon with L-3 ESS. Following acceptance, the material and all applicable certifications/test data shall be shipped to the destination designated on the L-3 ESS PO. In addition, a copy of all applicable certifications/test data shall be shipped to L-3 ESS.

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3 CERTIFICATIONS

3A CERTIFICATE OF CONFORMANCE (MANUFACTURER TRACEABILITY REQUIRED)

Revised August 29, 2013 (revised distributor section in its entirety)

MANUFACTURERS - A Certificate of Conformance (C of C) referencing the L-3 ESS PO, part number and lot identification, where applicable, shall be supplied with each shipment of the subject item. The certification shall be signed by an authorized representative and shall state that all materials and processes to produce the subject product/service as described on the PO conforms to the PO, specification and drawing requirements. See Notes 1 and 2.

DISTRIBUTORS - **You must be OCM/OEM authorized for the product being supplied** and include a copy of the original manufacturer's certification as described above with each shipment along with your certification referencing the L-3 ESS PO number.

Note 1: L-3 ESS piece part approval is granted on materials, processes and procedures established at time of initial procurement. Where a material, process or procedure change is incorporated by the supplier that may affect product quality, L-3 ESS procurement shall be notified.

Note 2: Subcontracted activities shall be performed by a designated design authority approved, government approved and/or L-3 ESS approved source.

Special instruction for date code (batch) and quantity recording: All date codes, date of manufacture, batch / lot numbers, serial numbers, the quantity, and the Country of Origin shall be listed on the packing slip and /or C of C.

Reference: L-3 ESS SQD.

3B SPECIAL PROCESS CERTIFICATION

Revised August 29, 2013 (added nadcap certified sources)

Certification shall be issued with each shipment stating that all special processes, such as but not limited to, metal to metal bonding, plating, anodizing, painting, finish/coating, chemical conversion, heat treating, non-destructive testing and destructive testing, demonstrate compliance with the requirement of the drawings, specifications and/or PO, and were accomplished by a National Aerospace and Defense Contractors Accreditation Program (NADCAP) accredited/certified source or a source approved by L-3 ESS. Reference: L-3 ESS SQD.

The certificate shall include the signature of an authorized representative of the supplier. In the event that the supplier must subcontract any or all of the above requirements, the same conditions will be applied to the subcontractors who shall produce written certification that all specification requirements have been fully complied with. The responsibility for collecting and issuing subcontractor certificates for each L-3 ESS shipment is that of the supplier designated on the PO.

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3C TRACEABILITY - RAW MATERIALS

Revised May 16, 2008 (added date codes/lot numbers requirement)

Certification is required for the subject commodity with each shipment against this PO. The certification shall be signed by an authorized representative of the supplier and must read substantially as follows: "Raw materials are traceable to physical/chemical test reports or inspection records at the point of manufacture. This data indicates conformance to all applicable PO requirements, referenced specifications or special requirements. Said reports and/or records show relevance to specific shipments against the referenced PO, and originals or true copies thereof are available for review by L-3 ESS upon request."

Also, the date codes/lot numbers of the raw materials used to produce the applicable item(s) shall be documented on the C of C (Ref QAP 3A).

3D MEASURING and TEST EQUIPMENT CERTIFICATION

Measuring and testing equipment used in this order shall be calibrated in accordance with the applicable system per QAP 1F. A certificate shall be supplied showing accuracy measured in terms of a standard that has been certified by the National Institute of Standards and Technology of USA or the National Research Council of Canada. The certificate shall include measured data and identification numbers of standards used.

3E SPECIAL TEST CERTIFICATION

Revised March 21, 2002 (minor changes, no change in content)

This commodity requires the performance of one or more special tests as indicated on this PO. The supplier shall furnish with each shipment a special test certification indicating that in fact all required tests have been performed. The test certification shall include:

1. The part number and designation.
2. The quantity of parts in this shipment.
3. The PO number of this shipment
4. The serial number of each part (if applicable)
5. The type and/or description of the test(s)
6. The specification number of drawing note to which each test is performed.

This certificate shall be signed by an authorized representative and shall include the name and address of the supplier.

3F MERCURY EXCLUSION

Revised March 21, 2002 (minor changes, no change in content)

The supplies furnished under this PO shall contain no metallic mercury or mercury compounds. It shall be free from mercury contamination (i.e. during the manufacturing process, tests or inspections, the supplies offered shall not have come in contact with mercury or any of its compounds nor with any mercury containing devices employing only a single boundary of containment.) A single boundary of containment is one that is not backed by a second seal or barrier to prevent contamination in the event of rupture of the primary seal or barrier). Mercury contamination of the supplies shall be cause for rejection of the material. The supplier shall furnish a signed certificate of conformance with each shipment.

3G CONTROL OF GRADE 5, GRADE 8, AND METRIC STANDARD HEX HEAD AND SOCKET HEAD FASTENERS

Issued May 04, 2009

When grade 5, grade 8 or Metric Standard (10.9) hex head and socket head fasteners are supplied independent of an assembly, original certification, shall be furnished with each shipment that documents the actual material chemistry, core hardness, or tensile strength (per table I or SAE J-429 for hex head or section e of FF-S-86E for socket head fasteners) and plating requirements (outlined in ASTM-B633). The laboratory test sampling size shall be performed in accordance with section 7.3 of SAE J-429.

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3H CERTIFICATE OF CONFORMANCE

Revised August 28, 2013 (added country of origin)

A Certificate of Conformance referencing the L-3 ESS PO, the part number, the manufacturer's name, and date code or lot or batch identification (as applicable) shall be supplied by the distributor and/or the manufacturer with each shipment of the subject item. The certificate shall be signed by an authorized representative and shall state that the subject product/service conforms to the PO, specification and drawing requirements. The supplier shall maintain a method of item traceability which ensures tracking of the item(s) back to the original manufacturer (OEM).

Special instruction for date code (batch) and quantity recording: All date codes, date of manufacture, batch / lot numbers, serial numbers, the quantity, and the Country of Origin shall be listed on the packing slip and /or C of C.

3J ORGANIC FINISH CERTIFICATION

Revised May 16, 2008 (added date codes/lot numbers requirement)

A certification shall be issued with each shipment and shall state that all processes demonstrate compliance with the requirements of the drawings, specifications or PO and was accomplished by a designated design authority, government and/or L-3 ESS approved source. Reference L-3 ESS SQD. Additionally, the current Chemical Agent Resistant Coating (CARC) Process Certification (form # GMD 4707-1) shall be issued, accompanied by supporting original manufacturer's certificates for paint and primer. The certificates shall include the signatures of authorized representatives of each supplier. In the event that the supplier must sub-contract any or all of the above requirements, then the same conditions shall be applied to the sub-contractors who shall produce written certification that all specification requirements have been fully complied with. The responsibility for collecting and issuing subcontractor certificates for each L-3 ESS shipment is that of the vendor designated on the PO.

Also, the date codes/lot numbers of the raw materials used to produce the applicable item(s) shall be documented on the C of C (Ref QAP 3A).

3L ALUMINUM PRETREATMENT PROCESS CERTIFICATION (CHROMIUM FREE PROCESS)

Issued May 1, 2002

Parts shall be pre-treated with either Henkel Alodine 5200 or Alodine 5700 per manufacturers recommended process. Minimum coating weights shall be 50mg/sq ft for Alodine 5200 and 8 mg/sq ft for Alodine 5700. Certification shall be issued with each shipment identifying the material used and stating that the required pre-treatment process was accomplished by a design authority designated, government approved and/or L-3 ESS approved source. Reference L-3 ESS SQD.

The certificate shall include the signature of an authorized representative of the supplier. In the event that the supplier must subcontract any or all of the above requirements, the same conditions will be applied to the subcontractors who shall produce written certification that all specification requirements have been fully complied with. The responsibility for collecting and issuing subcontractor certificates for each L-3 ESS shipment is that of the supplier designated on the PO.

Note: Where the drawing specifies Chemical Conversion Coating per MIL-C-5541, it shall be replaced with this Chromium Free Process.

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3M SPECIAL PROCESS CERTIFICATION (CHROMIUM FREE)

Issued July 11, 2002.

All special processes, including but not limited to, anodizing and painting, shall be performed using chromium free processes/materials. Chemical conversion coating per MIL-C-5541, when specified, shall be Class 3 only and is exempt from the chromium restriction. If there is a Class conflict with the drawing, the Class 3 requirement of this QAP shall take precedence.

All product manufactured with no trace of chromium shall be identified with a red letter "T" following the part identification number per MIL-STD-130. Any product manufactured containing trace elements of chromium (e.g. MIL-C-5541 Class 3) shall be identified with a black letter "H" following the part identification number per MIL-STD-130.

A special process certification shall be issued with each order identifying the chromium status of the product. The certificate shall include the signature of an authorized representative of the supplier. In the event that the supplier must subcontract any or all of the above requirements, the same conditions will be applied to the subcontractors who shall produce written certification that all specification requirements have been fully complied with. The responsibility for collecting and issuing subcontractor certificates for each L-3 ESS shipment is that of the supplier designated on the PO.

3N CERTIFICATE OF CONFORMANCE (NON MIL AND/OR NON DESIGN AUTHORITY CONTROLLED PRODUCT)

Revised May 16, 2008 (minor changes, no change in content)

Where Commercial Off The Shelf (COTS) and/or Vendor Controlled Product are incorporated into the procured assemblies a Certificate of Conformance(s) shall be supplied per QAP 3H.

3P DOCUMENTS REQUIRED WITH EACH SHIPMENT TO CUSTOMER

Revised may 16, 2008 (changed to civil aviation from transport)

All shipments of repaired units to L-3 ESS customers must be accompanied with/include:

- 1). A Civil Aviation Release Certificate;
 - 2). A Repair Report (Vendor Format).
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3Q CONFORMANCE DOCUMENTATION FOR AIRWORTHINESS: STANDARD AND COMMERCIAL REPLACEMENT PARTS

Issued April 14, 2008

Acceptable proof of conformance documentation to be supplied with each shipment shall consist of one of the following:

- a) A certificate of conformance signed by an authorized individual from an acceptable manufacturer, plus the certificate from distributor, if applicable
OR
- b) The distributor's certificate of conformance plus the information contained on the labelling or packaging or accompanying documentation shall include:
 - 1) Identification of the manufacturer.
 - 2) Identification of the manufacturer's standard and/or the manufacturer's part number and model number as applicable.
 - 3) Identification of the lot or batch number, if applicable.
 - 4) Cure date/shelf life, if applicable.

3R CONFORMANCE DOCUMENTATION FOR AIRWORTHINESS: AVIATION REPLACEMENT PARTS.

Revised June 3, 2009 (deleted note 1)

Acceptable proof of conformance documentation to be supplied with each shipment shall consist as a minimum of one of the following:

- a) Manufacturer's Certificate of Conformance or Release Certificate.
- b) Transport Canada Form, TCCA 24-0078, Authorized Released Certificate.
- c) FAA 8130-3, Authorized Release Certificate, or a FAA 8130-4, Export Certificate of Airworthiness or Joint Aviation Authorities (JAA) Form One, Authorized Release Certificate.
- d) A DND Form CF 1280, Certificate of Inspection and Release, or a release document containing the same information, from a Canadian contractor.
- e) A DoD Form 250, Materiel Inspection and Receiving Report, or a release document containing the same information, from a U.S. contractor.
- f) A CF543 (Off-Aircraft Unserviceability Record) for items that have been repaired or overhauled by CF maintenance organization or a contractor, or an equivalent to a CF543 contractor certificate.

3S SHIPPING TO A DESTINATION OTHER THAN L-3 ESS

Issued June 8, 2010

If the destination is not a L-3 ESS facility, Seller shall send a copy of the quality documentation invoked by this Purchase Order to the address designated elsewhere in this Purchase Order.

4 TEST REPORTS

4A CERTIFICATE OF ANALYSIS/PHYSICAL AND CHEMICAL TEST REPORT

Revised March 13, 2002 (minor changes, no change in content)

Certificate(s) of analysis/physical and chemical test report(s) shall be furnished covering material on the subject PO. The document/report shall show evidence of full compliance with all applicable specifications and referenced standards.

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4B REWORK/MODIFICATION/UPGRADE REPORT

Revised August 28, 2013 (added changes)

The supplier shall provide a complete description of the rework, modification or software upgrade required to return the nonconformance or changes to full compliance with the requirements of the procurement specification and purchase order. If any component replacement is required, a complete list of replacement components shall be included with full traceability as to part number, lot number or date code and the name of the component manufacturer.

4C REPAIR REPORT

Revised May 16, 2008 (minor changes, no change in content)

The supplier shall provide a complete description of the repair performed to return the item to the operational requirements. If component replacement is required, supplier shall record a complete list of replacement components. Supplier shall ensure full traceability as to part number, lot number or date code and the name of the component manufacturer.

4D FAILURE ANALYSIS

The supplier shall provide a failure analysis report which shall include as a minimum: a description of failure mode, the cause of failure, corrective action implemented to preclude recurrence of the failure, the corrective action effective date, lot number or serial number and reference the non-conformance report (NCR).

4E FIRST ARTICLE INSPECTION/TEST REPORT (FAIR)

Revised June 8, 2010 (complete re-write)

The supplier shall select, identify (non-permanently) and perform a complete First Article Inspection (FAI), one (1) representative piece unless otherwise specified in the Purchase Order (PO), from the first production lot to be submitted against this PO utilizing AS9102 as a guideline. The FAI shall verify item conformance and document (as appropriate to the order) the part number, revision, PO flow-down requirements, physical dimensions, chemical requirements, drawing notes, screening/test data, and tolerances along with the measured actual values (where applicable). In case of assemblies, the FAI requirements per this clause are applicable to custom (source controlled) sub-components that may be incorporated within the assemblies.

Dimensional reporting shall be listed utilizing the same format as the specification requirements (Eg. Geometric Dimensioning and Tolerancing). The supplier shall use numbered balloons to map measured dimensions/characteristics of the drawing to the FAIR. The FAIR shall include all supporting documentation including original manufacturers' certifications of compliance for raw material (Eg. laminates, epoxies, inks, coatings, finishes, etc.) specified on the drawing.

The supplier shall document the First Article Inspection/Test Report utilizing forms in AS9102 or L-3 ESS FAIR or supplier equivalent and shall be submitted with the first shipment.

For printed circuitry, the supplier shall supply a copy of each layer of the master pattern to remain the property of L3-ES.

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4F QUALIFICATION TEST REPORT

A qualification test report shall accompany the first shipment of this commodity. The qualification test report shall contain as a minimum:

1. Part number and revision of the commodity qualified.
2. Qualification test performed
3. The test equipment on which the tests were performed
4. The test equipment calibration status
5. The specification to which the tests were performed
6. The test conditions
7. The sample size submitted for each test
8. The number of test failures for each sample
9. The name of the laboratory or facility where the tests were performed
10. The signature, names and title of the authorized representative of the laboratory or facility.

4G PRODUCT QUALITY FLOW PLAN

Revised May 17, 2002 (minor changes, no change in content)

The supplier shall prepare and submit to L-3 ESS Quality Engineering, all applicable requirements of a "Product Quality Flow Plan". Unless otherwise specified the "Product Quality Flow Plan", together with the applicable copies of the following:

1. Inspection/Quality Instructions
2. Acceptance Test Procedure
3. Manufacturing traveller/flow diagram shall be submitted prior to the initial shipment of material to L-3 ESS.

Note: The Inspection/Quality Instruction/Acceptance Test Procedure and Manufacturers traveller need only be submitted once per requesting facility for a specific part number, unless revisions or changes have occurred to the previous submittals.

4H PRE-INSTALLATION FAILURE (PIF) REPORT - AIRWORTHINESS REQUIREMENT

Issued May 16, 2008

This article failed after being accepted by L-3 ESS on behalf of DND. The supplier shall provide a PIF report in supplier format which shall include as a minimum:

Short Term Corrective Action: a description of the failure mode, the cause of failure and a complete description of the repair performed to return the item to the operational requirements.

Long Term Corrective Action: A description of corrective action implemented to preclude recurrence of the failure, the corrective action effective date, lot number or serial number and reference the non-conformance report (NCR).

4J RADIOGRAPHIC INSPECTION REPORT

The supplier shall furnish x-ray film and laboratory reports for this commodity with each shipment against this PO. The x-ray film and laboratory report shall represent the lot ordered and shall be so identified.

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4K PERIODIC VALIDATION OF RAW MATERIAL (REF: AS9100)

Revised May 16, 2008 (minor changes, no change in content)

Where test reports or raw material certification testing is utilized by your company to verify purchased product, you must ensure that the data in those reports is acceptable per the applicable specifications.

As a minimum, once per calendar year, the quantitative chemical and physical properties from at least 3 samples of raw materials (sheet, bar, tube, billet, shot or other raw material) shall be validated to verify conformity to specification and comparison with test reports/certifications. This analysis/evaluation may be performed by yourself (if you have internal resources), an independent accredited lab or one approved by L-3 ESS. The validation shall be a continuous process encompassing raw materials from all manufacturers utilized in L-3 ESS end product.

A copy of all independent or internal raw material validations must be kept on file for L-3 ESS auditing purposes with a copy mailed to L-3 ESS SQE for review. Any raw material deviation from the specification requirements and/or exhibiting significant variation from the test reports must be reported immediately to L-3 ESS SQE for action.

Note: This is a system requirement for raw material validation not a requirement for each individual piece part or order.

5 TEST DATA

5A GROUP A TEST DATA/INSPECTION DATA (ATTRIBUTES)

Revised May 27, 2002 (minor changes, no change in content)

Group A and/or specification test/inspection attributes test data and required screening data in accordance with the applicable specification shall be furnished with each shipment against this PO. The test data shall bear the approval signature of an authorized representative of the supplier.

5B GROUP A TEST DATA (VARIABLES)

Revised May 27, 2002 (minor changes, no change in content)

Group A test data (read and record) in accordance with the applicable specifications for each lot code shall be furnished with each shipment against the subject PO. The test data shall bear the approval signature of an authorized representative of the supplier.

5C GROUP A TEST DATA (CERTIFICATION)

Revised November 21, 2011 (clarified certificate of compliance)

A Certificate of Compliance bearing the signature of an authorized representative of the supplier and referencing the L-3 ESS PO, part number and lot identification (where applicable) shall be furnished with each shipment per QAP 3A. Group A test data shall be retained in such a manner that it shall be readily available to L-3 ESS upon request for a minimum of five years.

5D GROUP B TEST DATA (VARIABLES)

Revised June 02, 2004 (added variables in header)

Group B test data in accordance with the applicable specifications for each lot code shall be furnished with each shipment against the subject PO. The test data shall bear the approval signature of an authorized representative of the supplier.

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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5E GROUP B TEST DATA (CERTIFICATION)

Revised June 02, 2004 (added variables in header)

A Certificate of Compliance bearing the signature of an authorized representative of the supplier and referencing the L-3 ESS PO, part number and lot identification (where applicable) shall be furnished with each shipment per QAP 3A. Group B test data shall be retained in such a manner that it shall be readily available to L-3 ESS upon request for a minimum of five years.

5F GROUP C TEST DATA (VARIABLES)

Revised May 27, 2002 (minor changes, no change in content)

Group C test data in accordance with the applicable specification shall be furnished with the first shipment against the PO for each lot code in the shipment. The test data shall bear the signature of an authorized representative of the supplier.

5G GROUP C TEST DATA (CERTIFICATION)

Revised June 02, 2004 (added variables in header)

A C of C bearing the signature of an authorized representative of the supplier and referencing the L-3 ESS PO, part number and lot identification (where applicable) shall be furnished with each shipment per QAP 3A. Group C test data shall be retained in such a manner that it shall be readily available to L-3 ESS upon request for a minimum of five years.

5H GROUP D TEST DATA (VARIABLES)

Revised June 02, 2004 (added variables in header)

Group D test data in accordance with the applicable specification shall be furnished with the first shipment against the PO for each lot code in the shipment. The test data shall bear the signature of an authorized representative of the supplier.

5J GROUP D TEST DATA (CERTIFICATION)

Revised May 27, 2002 (three year retention changed to five years)

A C of C bearing the signature of an authorized representative of the supplier and referencing the L-3 ESS PO, part number and lot identification (where applicable) shall be furnished with each shipment per QAP 3A. Group D test data shall be retained in such a manner that it shall be readily available to L-3 ESS upon request for a minimum of five years.

5K GEAR TEST DATA

Revised June 4, 2002 ("should include" changed to "shall include")

All gears on this PO require documentary evidence of conformance to all specification requirements. This shall include a continuous recorded (red lined) chart of the total composite error (after the final surface finish) with a minimum of one complete revolution with an indication of "start" and "stop".

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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5L ELECTRICAL/MECHANICAL INSPECTION DATA (READ AND RECORD)

Revised May 16, 2008 (combined QAP 5L and QAP 5M)

Electrical and/ or Mechanical, as applicable, test/inspection measurement results reflecting the requirements of the applicable specification shall be recorded. The test/inspection data pertinent to each shipment of this commodity against this purchase order shall be included with each shipment. and as a minimum includes:

1. Part number and revision
2. L-3 ESS PO number
3. Supplier's inspection/test procedure number and revision, if applicable.
4. Parameters tested or inspected.
5. 100% functional/electrical test and/ or mechanical* results (as applicable) of each component unless otherwise specified on the purchase order.
6. Date of test completion
7. Evidence of test acceptance by authorized supplier's representative

* Where specified, the data shall document measurements using Geometric Dimensioning and Tolerancing

6 WORKMANSHIP

6A ELECTRO-MECHANICAL ASSEMBLIES

Revised November 21, 2011 (aligned with ANSI/IPC J-STD-001 and IPC-A-610)

This commodity shall be manufactured and delivered in compliance with the workmanship requirements of ANSI/IPC J-STD-001 and IPC-A-610 class 3, unless otherwise specified in the PO.

Product must be qualified for cleanliness on the uncoated assembly. Verification of cleaning is required on two pieces of the first lot manufactured of each part number, tested per IPC-TM-650 method 2.3.28 (Ion Chromatography). Test results must be: CL < 2.5 $\mu\text{g}/\text{in}^2$, Br < 15.0 $\mu\text{g}/\text{in}^2$, NO3 < 3.0 $\mu\text{g}/\text{in}^2$, SO4 < 3.0 $\mu\text{g}/\text{in}^2$. Product that has been tested must be baked dry (125 C for 24 hours). Any changes in assembly chemistry or cleaning methods used on follow-on production must be re-qualified as acceptable per this method.

6B CASTINGS

Revised May 16, 2008 (minor changes, no change in content)

The material on the subject PO, as applicable, unless otherwise specified shall conform to the requirements of specification 990137 "Requirements for Castings" (ferrous and nonferrous castings) or SAE-AMS-A-21180 "Aluminum-Alloy Castings, High Strength"

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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6F FOREIGN OBJECT DEBRIS/DAMAGE (FOD) PREVENTION

Issued April 21, 2009

The supplier shall maintain a FOD prevention program. The program shall include (to the extent applicable) the review of manufacturing processes to identify and eliminate contamination or foreign object entrapment areas and paths through which foreign objects can migrate. Supplier shall ensure work (manufacturing, assembly, testing, and handling) is accomplished in a manner preventing foreign objects or material in deliverable items. Supplier shall maintain work areas and control tools, parts and material in a manner sufficient to preclude the risk of FOD incidents.

Supplier FOD prevention program shall contain the following:

- a) Implementation of FOD prevention, awareness and training.
- b) Periodic self assessment of its internal FOD prevention practices and shall measure effectiveness of program compliance to requirements.
- c) Method to flow down these requirements to sub-tier suppliers if applicable.

Delivery of product shall be deemed as certification that items delivered are FOD free.

6G PREPARATION and SOLDERING OF ELECTRICAL CONNECTIONS (ANSI/IPC J-STD-001)

Electronic equipment/assemblies supplied against this PO shall meet the requirements of ANSI/IPC J-STD-001. Classification level will be understood to be Class 3 unless otherwise specified in the PO.

7 CONTROLS/SPECIAL TESTS

7A MATERIAL SHELF LIFE

Revised February 15, 2002 ("or date of expiry" is no longer an option. QAP now specifies "and date of expiry")

Materials with a limited shelf life shall be supplied with an accompanying effective date of manufacture and date of expiry. At the time of receipt at L-3 ESS, the material shall have at least 75% of the shelf life remaining.

7B AGE and DATE CODE CONTROL

Revised May 1, 2002 (minor changes, no change in content)

The supplier shall deliver to L-3 ESS only those parts manufactured or re-inspected within the 40 months period prior to date of shipment. A date code lot marking on each individual part or on the packaging for those parts too small to be marked shall evidence this. (e.g. semi-conductor dice).

DATE CODE IDENTIFICATION

The supplier shall identify on his QPL certification(s), Certificate of Conformance or packing slip the part number and specific quantity of each date code lot and sub-lot shipped in response to the L-3 ESS PO. If the parts have been re-inspected to meet the 40-month criteria then the date code of the re-inspection shall be recorded on the applicable Certificate of Conformance.

Note: No shipment of an individual part number shall contain more than three (3) different date codes. If vendor is unable to meet this requirement, then the vendor shall notify L-3 ESS.

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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7C AIRWORTHINESS PART RE-CERTIFICATION

Revised September 3, 2013 (Clarified title)

Part requires re-certification by appropriate Engineering personnel on receipt at L-3 ESS as parts have been procured without appropriate traceability or conformance documentation. Activity shall be controlled per L-3 ESS positive recall system until recertification is completed.

7D PRINTED CIRCUIT BOARDS (IPC-6012)

Printed Circuit boards shall be fabricated as per IPC-6012 specification and shall meet the performance requirements of Class 3 (high reliability) of this specification.

7E FLEX PRINTS (IPC-6013)

Flex Prints shall be fabricated as per IPC-6013 specification and shall meet the performance requirements of Class 3 (high reliability) of this specification.

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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7G INDEPENDENT DISTRIBUTOR COUNTERFEIT PARTS PREVENTION CLAUSE – ACTIVE COMPONENTS

New, November 21, 2011 (in-line with Corporate Policy 602 latest revision)

Independent Distributor's procedures shall meet the requirements of IDEA-STD-1010 & SAE AS5553 and have a Quality Management System certified to AS9120:2002. The requirements of AS6081 shall be in effect upon industry release of this standard.

The original manufacturers Certificate of Conformance (C of C) and all traceability documentation shall be included with each shipment of parts. It shall include the manufacturer's name, part number, date codes, lot codes, serializations, and / or any other batch identifications. Seller is to contact Buyer in the event that the original OEM/OCM C of C and traceability documentation is not available. All inspecting and testing shall be performed to the original manufacturer's specifications and parameters. Recorded evidence of all testing performed shall be included with each shipment.

The following inspections and tests are required:

- Visual Microscopy Inspection of all parts in the order under 10X minimum magnification (100% of the lot)
- X-Ray inspection (100% of the lot)
- XRF/RoHS (2 parts per lot date code)
- Resistance to Solvents testing (2 parts per lot date code)
- Heated Solvent testing (Dynasolve Immersion) (2 parts per lot date code)
- Scrape testing (2 parts per lot date code)
- Solderability testing per IPC/EIA J-STD-002 (2 parts per lot date code)
- De-lid, Die Penetrate, Die Verification (2 parts per lot date code)
- Scanning Electron Microscopy (1 part per lot date code)

If suspect/counterfeit parts are furnished under this subcontract and are found in any of the goods delivered hereunder, such items will be impounded by Buyer. The Seller shall promptly replace such suspect/counterfeit parts with parts acceptable to the Buyer and the Seller shall be liable for all costs relating to the removal and replacement of said parts as specified in the subcontract requirements or Distributor's insurance policies. Buyer reserves all contractual rights and remedies to address grievances and detrimental impacts caused by suspect/counterfeit parts.

All occurrences of Suspect Counterfeit and/or Counterfeit parts will be immediately reported to ERAI.

L-3 ESS may flow down additional inspection/testing requirements via QAP 7J as appropriate.

7H CARBURIZING, NITRIDING, OR OTHER HARDENING PROCESSES

A representative coupon of minimum 15mm diameter or thickness and length equivalent to the thickness of the material to be hardened shall be cut from the same piece of stock as the supplied item. The traceable coupon shall be processed in an identical manner at the same time as the supplied item. The coupon and documentation certifying the grinding allowance after hardening shall be furnished to L-3 ESS with the supplied item.

7J COUNTERFEIT PREVENTION ADDITIONAL INSPECTION/TESTING REQUIREMENTS

Revised November 21, 2011

In addition to the tests specified in QAP 7G or QAP 7X (as applicable), the supplier shall perform at its facility or third party facility (as applicable) additional inspections/tests to the extent specified on the purchase order. Certifications and test data for all inspection/testing performed shall be included with each shipment.

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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7K SUPPLIER/SUBCONTRACTOR SPECIAL PROCESS CONTROL

Revised May 16, 2008 (minor changes, no change in content)

The supplier /subcontractor shall establish and maintain control of all special processes, such as but not limited to, metal to metal bonding, plating, anodizing, painting, finish/coating, chemical conversion, heat treating, non-destructive testing, and destructive testing. These form part of the manufacturing/inspection operations, or required safety precautions, equipment, essential processing environments and personnel qualifications which shall be in accordance with the contract or established procedures and be subject to approval or certification to the satisfaction of the purchaser.

7L INSPECTION/TESTING SAMPLING REQUIREMENT (MACHINED/FABRICATED PARTS)

The supplier shall perform sample inspection/testing in accordance with the applicable specification/drawing for each lot/shipment against this PO. When the specification/drawing does not specify the sampling plan, the supplier shall, as a minimum, inspect/test all parameters/characteristics to an AQL 1.0, normal level II inspection, and single sampling plan, per ANSI/ASQC Z1.4-1993 (current revision).

The supplier may utilize a reduced inspection/test-sampling plan if the requirements of ANSI/ASQC Z1.4-1993 (current revision) are fulfilled and/or when the records or inherent characteristics of the product indicate that a reduction in inspection/testing can be achieved without jeopardizing product quality.

7M CONTROL OF MOISTURE SENSITIVE, PLASTIC ENCAPSULATED ELECTRONIC DEVICES

Revised October 2001 (IPC/JEDEC J-STD-033 introduced)

The supplier must classify and package components in accordance with IPC/JEDEC J-STD-033. All discrete packages must be labeled in accordance with IPC/JEDEC J-STD-033.

7N SHELF LIFE FOR PRINTED CIRCUIT BOARDS

Revised June 12, 2002 (minor changes, no change in content)

Printed circuit boards as received at L-3 ESS shall have a minimum remaining balance of six months shelf life for tin-lead plated fused boards and three months for hot air solder coated boards.

The shelf life for tin-lead plated fused boards has been established as nine months and for solder coated boards as four months, from the date of manufacture recorded on the board.

7P PRINTED CIRCUIT BOARD ELECTRICAL TEST

Printed circuit boards shall be 100% electrically tested as per IPC-ET-652 against the Net List (if provided by LSC), otherwise the part shall be tested against a known good board (Golden board). The parameters of the test shall be as follows:

1. Circuit continuity shall be tested using a test voltage of 150-250 VDC. There shall be no open circuit whose resistance exceeds 10 ohms.
2. Circuit shorts shall be tested using a test voltage of 150-250 VDC. The resistance between mutually isolated conductors to be > 10 meg-ohms.

Acceptable printed circuit boards shall be identified by the testing facility with a unique acceptance stamp in any suitable place that will not be covered by a component. Acceptable printed circuit boards whose available area is physically too small to mark with a stamp shall have the test certification indicating acceptance. The subject part number and date code accompanying each lot and shall have a white epoxy ink dot placed next to vendor source identification by the manufacturer. Lot results for all printed circuit boards shall accompany each shipment to L-3 ESS.

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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7Q PIND TEST

The supplier shall perform particle impact noise detection (PIND) test on each component in accordance with the following applicable specifications. MIL-STD-750, Method 2052 (semiconductors) or MIL-STD-883, Method 2020 (microcircuits) Condition B, pre and co-shock levels of 1000 g, vibration level 10g at 60 Hz, dwell time 4 seconds at 60 Hz. Test results shall be furnished with each shipment.

7R NONDESTRUCTIVE BOND PULL TEST REQUIREMENTS - SEMICONDUCTORS

Revised June 20, 2002 (removed specific references to wire bond pull test force of 10 grams)

Nondestructive wire bond pull test is to be performed on each device (100%) in accordance with MIL-STD-883, Test Method 2023. With each shipment the supplier shall provide L-3 ESS documentation indicating the failure modes for the failed bonds and attribute summary of the nondestructive bond pull test results.

7S SOLDERABILITY

Each shipment shall meet the solderability requirements of MIL-STD-202, Method 208, MIL-STD-750, Method 2026, or MIL-STD-883, Method 2003 as applicable or the solderability requirements of ANSI/IPC J-STD-002.

Note: Preferred requirement is compliance with ANSI/IPC J-STD-002.

7T HOT SOLDER DIP REQUIREMENT

All solderable terminals/leads of each part shall be hot solder dip (HSD) coated with QQ-S-571, Sn60 or Sn63 solder (or ANSI/IPC J-STD-006, Sn60Pb40Sb.4A or Sn63Pb37Sb.4A solder). Each shipment shall meet the solderability requirements of MIL-STD-202, Method 208, MIL-STD-750, Method 2026, or MIL-STD-883, Method 2003 as applicable or the solderability requirements of ANSI/IPC J-STD-002.

Note: Preferred requirement is compliance with ANSI/IPC J-STD-002 and 006.

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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7U SUBCONTRACTORS AND CONTRACT MANUFACTURERS COUNTERFEIT PARTS PREVENTION CLAUSE

New, November 21, 2011 (in-line with Corporate Policy 602 latest revision)

Only new and authentic materials are to be used in products delivered to Buyer. No counterfeit or suspect counterfeit parts are to be contained within the delivered product. Parts shall be purchased directly from the OCMs/OEMs, or through the OCM/OEMs Franchised Distributor. Documentation must be available that authenticates traceability to the applicable OCM/OEM. Independent Distributors (Brokers) shall not be used without written consent from Buyer (L-3).

Definitions:

Counterfeit – a part that is an illegal or unauthorized copy or substitute of an OEM item; an item that does not contain the proper external or internal materials or components required by the OEM or that is not constructed in accordance with OEM specification; an item or component thereof that is used, refurbished or reclaimed but the Seller represents as being a new item; an item that has not successfully passed all OEM required testing, verification, screening and quality control but that Seller represents as having met or passed such requirements; or an item with a label or other marking intended, or reasonably likely, to mislead a reasonable person into believing a non-OEM item is a genuine OEM item when it is not. Parts that have been modified pursuant to a specific L-3 purchase order requirement, such as refinished, up-screened, or up-rated parts that are properly identified as such are not considered suspect or counterfeit.

Suspect Counterfeit – A part in which there is an indication by visual inspection, testing, or other information that it may have been misrepresented by the supplier or manufacturer and may meet the definition of a counterfeit part.

OCM – Original component manufacturer

OEM – Original equipment manufacturer

Franchise Distributor – - A distributor with whom the OCM has a contractual agreement to buy, stock, re-package, sell and distribute its product lines. Franchised distributors normally offer the product for sale with full manufacturer's warranty. Franchising contracts may include clauses that provide for the OCM's marketing and technical support, failure analysis and corrective action, and exclusivity of inventory.

Independent Distributor (Broker) – A distributor that purchases parts with the intention to resell them. Independent Distributors may be franchised for selected, but not all, product lines. For purposes of counterfeit risk mitigation, a distributor is considered independent when not franchised for the item to be procured.

7V SPECIAL TEST REQUIREMENT (PRESSURE)

Pressure tests are to be performed on this commodity in accordance with the requirements of the applicable drawings or specifications as indicated on this PO. Special test certification (QAP 3E) shall accompany each shipment.

7W SPECIAL TEST REQUIREMENT (SEAL)

All parts shall be seal test 100% in accordance with the applicable method specified on the PO or in the procurement specification. Special test certification (QAP 3E) shall accompany each shipment.

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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7X INDEPENDENT DISTRIBUTOR COUNTERFEIT PARTS PREVENTION CLAUSE – PASSIVE COMPONENTS & CONNECTORS

New, November 21, 2011 (in-line with Corporate Policy 602 latest revision)

Independent Distributor's procedures shall meet the requirements of IDEA-STD-1010 & SAE AS5553 and have a Quality Management System certified to AS9120:2002. The requirements of AS6081 shall be in effect upon industry release of this standard.

The original manufacturers Certificate of Conformance (C of C) and all traceability documentation shall be included with each shipment of parts. It shall include the manufacturer's name, part number, date codes, lot codes, serializations, and / or any other batch identifications. Seller is to contact Buyer in the event that the original OEM/OCM C of C and traceability documentation is not available. All inspecting and testing shall be performed to the original manufacturer's specifications and parameters. Recorded evidence of all testing performed shall be included with each shipment.

The following inspections and tests are required:

- Applicable electrical testing (resistance, capacitance, continuity) for the devices procured (1% AQL Level II)
- Visual Microscopy Inspection of all parts in the order under 10X minimum magnification (100% of the lot)
- X-Ray inspection for non-glass diodes and tantalum capacitors (100% of the lot)
- XRF/RoHS (2 parts per lot date code)
- Resistance to Solvents testing (2 parts per lot date code)
- Heated Solvent testing (Dynosolve Immersion) (2 parts per lot date code)
- Scrape testing (2 parts per lot date code)
- Solderability testing per IPC/EIA J-STD-002 (2 parts per lot date code)
- Scanning Electron Microscopy for metal packaged parts only (1 part per lot date code)

If suspect/counterfeit parts are furnished under this subcontract and are found in any of the goods delivered hereunder, such items will be impounded by Buyer. The Seller shall promptly replace such suspect/counterfeit parts with parts acceptable to the Buyer and the Seller shall be liable for all costs relating to the removal and replacement of said parts as specified in the subcontract requirements or Distributor's insurance policies. Buyer reserves all contractual rights and remedies to address grievances and detrimental impacts caused by suspect/counterfeit parts.

All occurrences of Suspect Counterfeit and/or Counterfeit parts will be immediately reported to ERAI.

L-3 ESS may flow down additional inspection/testing requirements via QAP 7J as appropriate.

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

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7Z PURE TIN ON COPPER/COPPER ALLOY SOLDERABLE COMPONENT LEAD/TERMINATION FINISH EXCLUSION

Revised July 30, 2008

Solderable components shall not be pure tin on copper as a lead/termination finish. Acceptable lead/termination finishes in order of preference:

1. Hot tin-lead (Sn60Pb40Sb.4A or Sn63Pb37Sb.4A) solder dip,
2. Tin-lead (Sn60Pb40Sb.4A or Sn63Pb37Sb.4A), plated reflow,
3. Nickel/Palladium/Gold finish,
4. Sn85/Pb15,
5. Sn90/Pb10,
6. Sn95/Pb5,
7. Matte tin with a minimum of 50 micro inches of electroplated nickel as a plating barrier between copper and matte tin,
8. SAC alloys – conforming to IPC-J-STD-006, e.g.
 - 95.5Sn/3.8Ag/0.7Cu (217 deg. C)
 - 95.8Sn/3.5Ag/0.7Cu (217 deg. C)
 - 96.5Sn/3.2Ag/0.4Cu (217 deg. C)
 - 96.3Sn/3.7Ag (221 deg. C)
 - 96.5Sn/3.5Ag (221 deg. C)
9. 100% matte tin on copper/copper alloy, with or without annealing after plating. Provided the following is met:
 - Part or lead termination spacing/part proximity must be reviewed for tin whisker growth
10. 100% matte tin, annealed, on copper/copper alloy or alloy 42 family of nickel-iron alloys.

8 IDENTIFICATION and MARKING REQUIREMENTS

8B SERIALIZATION

The supplier shall identify each individual unit/item supplied to L-3 ESS with a unique serial number. The serial number shall be applied by means that will ensure legibility and permanency without affecting the fit, form or function of the item so identified. Where method or location of serialization is in doubt, L-3 ESS SQE must be consulted. The serial numbers shall be sequential and shall not be repeated within a specific part number.

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

8C WIRE/TUBING/SLEEVING

Revised June 11, 2002 (AMS and SAE specifications added)

Each spool/reel/coil on the subject PO must be legibly and permanently identified with label or tag per the applicable specification or with the following information:

1. Manufacturers name and part number
2. L-3 ESS part number (where applicable)
3. L-3 ESS PO number
4. Quantity
5. Gauge (AWG) and description
6. MIL/AMS/SAE or other Specification and Type (where applicable)

Cure date and lot number (where applicable).

8E DIE IDENTIFICATION

The supplier shall identify intimate packaging of die (waffle packs etc.) with the lot number traceable to the original manufacturer (depositions/diffusions) and explanation of such, as well as the configuration revision of product supplied. The supplier shall also supply diagram of the die, indicating overall dimensions and location/identification of bonding pads.

9 PACKAGING

9A STATIC SENSITIVE MATERIALS

All materials, components or assemblies susceptible to being degraded, damaged or destroyed by electrostatic charges (Reference: MIL-STD-1686, Table II and MIL-HDBK-263, Table IV) shall be intimately packaged in sealed ESD protective containers that will protect contents from triboelectric charging, direct contact with charged objects and electrostatic fields. Protection shall be provided to prevent physical damage and to maintain leads and terminals in the manufactured condition under handling and transportation environments. Materials used for intimate packaging shall be non-corrosive and non-static generating. Conductive shunting foam, bars or clips shall be applied on electrical connectors to short all connector pins and the connector shell together. Intermediate packaging shall be clearly labeled or marked to indicate that the contents are subject to damage or degradation by electrostatic discharge. (Ref. MIL-STD-129).

Note: The packaging of the material shall not in any way affect solderability of the part.

9B PROTECTION AGAINST ENVIRONMENTAL AGENTS and CONDITIONS

Revised May 16, 2008 (minor changes, no change in content)

Unless otherwise specified on the drawing, specification, or the PO, the following requirements are mandatory:

1. Prior to packaging, material shall be clean (free from foreign matter). Critical functioning or close tolerance surfaces shall be cleaned to ensure removal of corrosion, soil, grease, residues and fingerprints, perspiration or other acid and alkali residues.
2. Material not inherently resistant to corrosion shall be inhibited with a suitable medium.
3. Material shall be packaged to the extent necessary to provide protection from the hazards of contamination and physical damage encountered in general handling, shipping, shelf storage and issue.

L-3 ESS Quality Assurance Provisions (QAPs) Revised September 3, 2013

NOTE: All Quality Assurance/Control Systems data and documentation called out on the purchase order must be placed with the parts/components inside the shipping container/package. Failure to comply fully with the provisions/requirements may adversely affect the Supplier Quality Rating and can result in the return of the complete shipment at your expense.

QAP Description

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9C BEARINGS

Bearings shall be packaged individually in a plastic bag or box in accordance with QAP 9B. Packaged bearing pairs/sets, must be kept together in suitable intermediate packaging. All the intermediate package must be clearly marked with L-3 ESS part number and revision (where applicable).

9D BERYLLIUM PACKAGING

If not specified on applicable specification, each part shall be enclosed in an individual heat-sealed poly coated mylar, nylon, or polyethylene bag and the package labeled essentially as follows, color **RED**:

WARNING: BERYLLIUM PRODUCT
Hazardous dust or vapors produced by machining, filing, welding, grinding or chemical etching.

Each bagged part shall be further packaged as necessary to prevent physical damage (through shock, vibration, handling, abrasion, scratching etc.) Beryllium dust content shall not exceed two (2) micrograms per units' package.

9E TAPE AND REEL PACKAGING

Revised September 7, 2003 (Toronto facility requirements deleted)

Components shall be packaged on tape and reel per the current specification ANSI/EIA-481, appropriate for the component. PLCC or SOIC integrated circuits in quantities of less than 1000 components may be supplied in tubes, if appropriate. Matrix trays shall be used for quad flat pack components.

9F LIFE TIME PROCUREMENT

Revised June 02, 2004 (added last sentence L-3 ESS incoming inspection shall identify the product per Engineering Guideline No. 93960.)

Due to product obsolescence, L-3 ESS is making a Lifetime Buy to support program(s) life expectancy. If specified, the supplier shall fulfill the special preservation/packaging requirements as stipulated in the body of the PO. L-3 ESS incoming inspection shall alert store to package the product per Engineering Guideline No. 93960.

10 NOTES:

XX QE Notes.