



Supplier Quality Notes

PL-QA-001
Revision B

Approvals

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1. SCOPE

1.1 Purpose

The purpose of this document is to formally communicate the quality requirements to external providers of processes, products and services in accordance with AS9100 8.4.

This document contains the standard quality clauses, which CesiumAstro Mission Assurance & Quality should apply to requisitions before approval and submittal to Supply Chain for incorporation into Procurement/Subcontract agreements. Programs with unique contract requirements not satisfied by these clauses are required to flow down other requirements to suppliers and subcontractors to comply with the Programs' contracts.

1.2 Distribution

PL-QA-001 shall be distributed to sub-contractors, suppliers and the sub-tier supply chain. The supplier is responsible for ensuring that its own organization and entire supply chain that provides an end product or service which forms part of a product or service required by CesiumAstro meets the appropriate quality requirements. This information to be controlled in accordance to relevant contracted security classification of information to be exchanged between CesiumAstro and supplier. A Non-Disclosure Agreement may be required for exchange of proprietary information and data.

1.3 Order of Precedence

Any inconsistencies in this document shall be resolved in accordance with the following order of precedence: (1) Statutory and regulatory requirements, (2) the contract (purchase order), including any special terms and conditions, (3) the drawing, design data and any CesiumAstro approved concession or production permit, (4) any Statement of Work, (5) PL-QA-001.

2. REFERENCES

2.1 Definitions

- Buyer: CesiumAstro Procurement entity (also known as the Buyer/Subcontract Administrator)
- Seller (AKA Manufacturer, Supplier, Vendor, Distributor, Subcontractor): The legal entity that is the contracting party with the Buyer with respect to the procurement document.
- Procurement Document: The Purchase Order or subcontract between the parties.
- Item: The product or service contracted for by the procurement document.
- Rework: Previously documented and approved process that bring the product into conformance with defined requirements.
- Repair: A condition where the product cannot conform to engineering standards; however, a subsequent operation can be performed to return the product to a condition that shall meet fit, form, and function.

- The terms "shall" and "must" mean that the described action is mandatory; "should" means that the described action is expected with some flexibility allowed in the method of compliance; and "may" means that the described action is permissible or discretionary.

2.2 Abbreviations

- AS Aerospace Standard
- CMMI Capability Maturity Model Integration
- CTF Critical to Function
- DFARS Defense Federal Acquisition Regulation Supplement
- DoD Department of Defense
- DSA Defense Supply Agency
- ECP Engineering Change Proposal
- EIDP End Item Data Package
- ESD Electrostatic Discharge
- FOD Foreign Object Debris
- GIDEP Government Industry Data Exchange Program
- ISO International Organization for Standardization
- MIL Military
- MRB Material Review Board
- MSDS Material Safety Data Sheet
- NASA National Aeronautics and Space Administration
- NIST National Institute for Standard Technology
- OCM/OEM Original Component Manufacturer/Original Equipment Manufacturer
- QPL Qualified Parts List
- SCAR Supplier Corrective Action Request
- SEI Software Engineering Institute
- SEM Scanning Electron Microscope
- UID Unique Identification

2.3 Reference Documents

- PR-PRC-001 Procurement
- PR-ENG-007 Materials & Process Requirements for PCBA Manufacturers
- PR-QA-014 Counterfeit Parts Control Plan

3. SUPPLIER QUALITY REQUIREMENTS

Q001 GENERAL QUALITY ASSURANCE REQUIREMENTS

A. PROHIBITED MATERIALS

1. Unauthorized Repairs: Seller **shall** not repair any damaged item, or any item found to be faulty during manufacturing or that fails to meet Buyer specification/drawing requirements, without Buyer's written approval, except when the nonconformance is minor and Material Review Board (MRB) authorization has been granted by CesiumAstro. Seller is not authorized to perform MRB activities on non-conforming materials without Buyer authorization.
2. Change in Approval, Drawing, Processes, Materials, or Procedures: Seller **shall** not change any drawing, process, material (including sub-tier supplier parts), or procedure without prior Buyer's written approval, if such drawing, process, material, or procedure was used to qualify items or which was used by Seller to become a qualified source.
3. Seller **shall** notify Buyer in writing of any proposed change in design, fabrication method, or process prior to delivery of the item to the Buyer.
 - a. Articles, which have incorporated approved changes, shall be appropriately identified.
4. Resubmittal of Rejected Items: Any item rejected by Buyer and subsequently resubmitted to Buyer **shall** be clearly identified as a resubmitted item, indicating the procurement document number and Buyer's reject document number in Seller's Certificate of Conformance.
5. Notification of Facility Change: Seller **shall** not use any production, manufacturing, and/or processing facilities that differ from facilities previously approved by Buyer without first notifying Buyer and affording Buyer an opportunity to examine and approve such facilities for compliance with procurement quality requirements. Seller **shall** not relocate any production, manufacturing, and/or processing facilities previously approved by Buyer without first notifying Buyer and affording Buyer an opportunity to examine and approve such facilities for compliance with supplier quality requirements.
6. Changing of Test Facility: Seller **shall** not change a test facility or use another test facility to meet specification/drawing requirements without prior Buyer's written approval, if a specific test facility was previously approved by Buyer as provided for in the procurement document.
7. Change of Management/Owner: Seller **shall** notify Buyer when a significant change in management or ownership has occurred.

B. RESPONSIBILITY FOR CONFORMANCE

1. Seller **shall** control sub-tier supplier procurements to the extent necessary to ensure quality requirements specified in the procurement document are satisfied.
2. Quality requirements **shall** include, but are not limited to, the following:
 - a. Sub-tier supplier pre-award survey/evaluations
 - b. Periodic auditing of supplier
 - c. Implementing a sub-tier supplier rating system

- d. Ensuring adequate review of procurement documentation prior to procurements
- e. Controlling procurement of items for Seller's product
- f. Inspection of procured items to documented procedures
- g. Control of non-conforming material, including corrective action

C. CORRECTIVE ACTION REQUEST

1. When a quality problem exists with Seller's items, Buyer **may** require Seller to complete a Supplier Corrective Action Request (SCAR).
2. Responses to Supplier Corrective Action Requests **shall** be timely and **shall** include the following information:
 - a. Root cause of the deficiency
 - b. Action taken to correct the specific deficiency
 - c. Action taken to prevent recurrence of the deficiency
 - d. Action taken to determine if other products are affected
 - e. Effectivity date for implementation of identified corrective and preventive actions
 - f. Verification that the corrective and preventive actions are effective

D. MEASURING AND TEST EQUIPMENT

1. Seller **shall** be responsible for validating the accuracy and stability of tools, gages, and test equipment used to demonstrate that any item conforms to the requirements specified in the procurement document.
2. Documented schedules **shall** be maintained for periodic calibration to adequate standards.
3. Objective evidence of calibrations **shall** be recorded and made available for Buyer's review.

E. NONCONFORMING MATERIALS

1. Seller **shall** provide and maintain a corrective action and disposition program for non-conforming materials.
2. Seller **shall** provide for control, segregation, and identification of non-conforming materials detected at Seller's facilities.
3. Seller **shall** not have MRB disposition authority without Buyer's written authorization.
4. No repair **shall** be allowed outside of the specific specification limits unless prior written approval is obtained by Seller from Buyer.

F. INSPECTION RECORDS

1. Seller **shall** maintain records of all inspections and tests performed on any item delivered to Buyer.
2. Records **shall** identify any non-conformance and **shall** be made available for Buyer's review.
3. Seller **shall** ensure records are available for review by Customers and Regulatory Authorities in accordance with contract or regulatory requirements.

G. SAMPLE INSPECTION

1. Seller, prior to implementation of a sampling plan, **shall** provide a copy of said plan to the Buyer. Buyer reserves the right to reject any plan which does not conform to the quality requirements of the program.
2. Seller **may** use sample inspection plans, when tests are destructive, or when the records or inherent characteristics of the product indicate that a reduction in inspection/testing can be achieved without jeopardizing product quality.
3. Sample inspection **shall** be in accordance with the applicable Buyer specification. When not specified by Buyer, military standard sampling plans, e.g., from ANSI/ASQCZ1.4-11, MIL-STD-414, **may** be used.
4. All sample inspection plans **shall** provide valid confidence in specified quality levels.

H. IDENTIFICATION

1. All materials **shall** be identified by a part number and revision, permanently and legibly affixed directly to the surface of each article,
2. In the event this is not possible due to physical size or nature of material, an identification tag **shall** be securely affixed to each article, or
3. If articles are supplied in individual or multi-unit containers the container **shall** reveal the appropriate identification.

I. PACKAGING, PRESERVATION, AND STORAGE

1. Seller **shall** incorporate good commercial practices for preservation and packaging of all articles that apply to this Purchase Order / Subcontract, unless otherwise stated within the Purchase Order / Subcontract or attached documentation.
2. Seller **shall** identify each package permanently and legibly with Purchase Order / Subcontract number, manufacturer's name, date shipped, and packing sheet number.
3. Packaging **shall** be selected, to the extent necessary, to provide protection from physical and environmental damage during shipping and handling.
 - a. Cushioning materials shall be applied, as required, to protect and to restrict movement of items.
4. All materials which are volatile, toxic, or emit fumes, which are harmful to human health, **shall** be properly contained in accordance with applicable health and safety requirements. Seller **shall** take appropriate measures to prevent handling damage, from preparation for shipment through receipt (i.e., palletizing, shrink wrapping, or otherwise securing materials for shipment to prevent degradation during transit).
 - a. Containers shall be plainly marked as to its contents with appropriate warnings, precautions, instructions, and storage conditions.
 - b. Material Safety Data Sheet (MSDS) shall be included with each shipment.

J. STORAGE AND SHELF LIFE

1. Seller **shall** identify materials and articles having definite characteristics of quality degradation or drift with age and/or the environment. Where shelf life is either a specified requirement or is needed to ensure end-of-life performance, the seller **shall** affix appropriate label identifying the shelf life expiration date to supplied materials.
2. Identification **shall** indicate the date and/or cycle that the critical life was initiated and the date and/or cycle at which the useful life will be expended.

3. If environment is a factor in determining useful life, identification **shall** also include the storage temperature, humidity, etc., required to achieve the stated useful life.
4. In no case **shall** materials or articles be supplied to Buyer with less than 75% of its useful life or cycles remaining; however, Seller **shall** verify that sufficient operating life and environmental margin remains to meet the specified requirements of the procurement document.

K. CONTROL OF PROCESSES

1. Seller **shall** monitor processes to ensure supplier services and/or products meet contractual requirements.
2. Seller **shall** take corrective action when process measures indicate that products or services could potentially falls outside of acceptable, contractual limits.

Q010 QUALITY MANAGEMENT SYSTEM**A. ISO 9001 COMPLIANT**

1. Seller **shall** provide and maintain a Quality System that is compliant to ISO 9001.
2. Seller's capability to perform satisfactorily to these requirements **shall** be demonstrated by having a successful audit performed by Buyer.

B. ISO 9001 REGISTERED

1. Seller **shall** provide and maintain a Quality System that is registered to ISO 9001.
2. Seller's capability to perform satisfactorily to these requirements **shall** be demonstrated by having an ISO Certification from an accredited registrar.
 - a. Buyer **shall** reserve the right to conduct an assessment of Seller's Quality System.

C. AS9100 COMPLIANT

1. Seller **shall** provide and maintain a Quality System that is compliant to AS9100.
2. Seller's capability to perform satisfactorily to these requirements **shall** be demonstrated by having a successful audit performed by Buyer.

D. AS9100 REGISTERED

1. Seller **shall** provide and maintain a Quality System that is registered to AS9100.
2. Seller's capability to perform satisfactorily to these requirements **shall** be demonstrated by having an AS9100 Certification from an accredited registrar.
 - a. Buyer **shall** reserve the right to conduct an assessment of Seller's Quality System.

E. QUALITY MANAGEMENT SYSTEM

1. Seller **shall** have a formalized Quality System.
2. Seller's capability to perform satisfactorily to these requirements **shall** be demonstrated by a successful Buyer's Supplier Assessment Audit of the seller's Quality System.

Q020 SELLER'S BASIC CERTIFICATE OF CONFORMANCE

Note: A applies when clause is required unless subclause B is specified. Clause C applies if material traceability must be proven.

- A.** A Certificate of Conformance **shall** be provided with each shipment with the following information at a minimum:
1. Purchase Order / Subcontract and Line Item Number
 2. Identifying nomenclature as identified by the purchase order (i.e., Item Name, Part Number, Revision, Serial Numbers).
 3. Date code and/or lot number
 4. Quantity shipped.
 5. The Certification of Conformance shall be signed by Seller's duly authorized representative (including electronic signatures).
- B.** The seller **shall** provide their standard Certificate of Conformance to certify that the articles delivered under this Purchase Order / Subcontract conform to the applicable requirements of Buyer's or Manufacturer's specifications for the article ordered.
- C.** The seller **shall** provide a Certificate of Traceability showing unbroken chain of custody from the lowest level component to configured end item(s).

Q030 RAW MATERIAL DOCUMENTATION

Note: A and B apply when clause is required.

A. SELLER RAW MATERIAL RESPONSIBILITY

Shipment of materials, whether raw, semi-finished, or finished, **shall** be accompanied by a Certificate of Conformance/ from Seller, stating at a minimum:

1. Material identification by specification number and material conditions, where applicable.
2. The raw material manufacturers or mill's lot or batch number.
3. A statement of raw material conformance to applicable requirements.
4. The name and location of the raw material manufacturer or mill.

B. MATERIAL CERTIFICATE OF ANALYSIS

Actual chemical/physical test results that substantiate compliance with the applicable raw material and/or specification requirements **shall** be provided.

Q040 CONTROL OF SPECIAL PROCESSES

Note: A and B, or C apply when clause is required

- A.** Buyer **shall** approve special processes performed by Seller, or any of its sub-tier suppliers, including the system/procedures used to control special processes. Processes requiring Buyer approval include:
1. Welding, destructive physical analysis, brazing, dye penetrant inspection, painting, radiographic inspection, plating, heat treating of metals, casting, chemical surface treatments, forging, contamination control, bonding, magnetic particle inspections, conformal coat, composites, soldering, pressure test, and ultrasonic inspection.
 2. Any other processes defined in the Purchase Order / Subcontract
- B.** Buyer approval of special processes **shall** not relieve Seller of responsibility for exercising the control measures necessary to ensure delivered items conform to the requirements of the Purchase Order / Subcontract.
- C.** Sub-contract and Contract manufacturers **shall** have the responsibility of approving, auditing, and maintaining their sub-tier suppliers for special processes. CesiumAstro reserves the right to review any records pertaining to special processes and will be made available for review upon request.

Q050 CALIBRATION SYSTEM REQUIREMENTS

Note: A and B apply when clause is required.

- A.** Seller **shall** be responsible for the calibration, accuracy, validation, and maintenance of any equipment, tooling, or gauges utilized by Seller to produce, inspect, or test articles to be delivered under this Purchase Order / Subcontract.
- B.** Seller's equipment calibration system **shall** be in accordance with one of the four requirements listed below:
 - 1. MIL-STD-45662A or
 - 2. ANSI/NCSL Z540 or
 - 3. ISO 10012-1
 - 4. ISO 17025

Q060 TRACEABILITY

Traceability of the entire supply chain shall be maintained, including traceability to Original Equipment Manufacturer (OEM). Traceability reduces risks of counterfeit articles entering the supply chain.

Category	Traceability Requirement
Raw Material	Lot traceable to manufacturers part number and batch with original manufacturers MTC (Mill Test Certificate) EN 10204 Type 2.1, 2.2, 3.1 or 3.2
Manufactured Parts	Traceability shall be maintained for all product throughout production from raw material to finished product (including product quantities, split orders, nonconforming product etc.) Raw material used shall be Lot traceable to manufacturers part no, lot no, date code with Mill Test Certificate
COTS	Traceability through supply chain to Original Equipment Manufacturer (OEM)
MOTS	Traceability shall be maintained for all product modifications throughout production from material to finished product (including product quantities, split orders, nonconforming product etc.) The originating COTS item(s) shall have Traceability through supply chain to Original Equipment Manufacturer (OEM) Requirements specified for Raw Material & Mechanical/Electrical parts also apply where applicable for item modifications
EEE Parts	Lot traceable to Original Equipment Manufacturers part no, lot no or date code

Q070 SINGLE LOT DATE CODE

1. Seller shall provide the full quantity of each part number provided under this purchase order with one single lot/date code. Seller will obtain the written approval of CesiumAstro authorized purchasing representative prior to shipping goods that do not meet this single-lot/date code requirement.
2. If CesiumAstro's purchasing representative provides authorization in writing to ship mixed lot/date codes, the seller shall provide a copy of CesiumAstro's written authorization with the shipping document.
3. When mixed lot/date codes are authorized, the shipper shall list individual lot/date codes and quantity. In addition, the individual part containers shall be marked with the quantity and lot/date code.

Q100 REQUIREMENTS FOR DISTRIBUTORS

Note: A, B and C apply when clause is required unless only 1 subclause is specified.

- A.** The Distributor (a Seller other than the manufacturer) **shall** certify that the articles delivered under this Purchase Order / Subcontract conform to the applicable requirements of Buyer's or Manufacturer's specifications for the article ordered.
- B.** The Distributor Certificate of Conformance **shall** include the following information:
 - 1. The origin of manufacture
 - 2. Part number
 - 3. Applicable traceability information (date code and/or lot code, country of origin)
 - 4. Results of testing or special inspection, as required.
 - 5. Items identified by Buyer number **shall** have complete information as to the original manufacturer and original manufacturer's part number.
- C.** The Distributer Certificate of Traceability **shall** provide documented traceability and unbroken Chain of Custody from the OCM/OEM to the Seller.

Q110 REQUIREMENTS FOR SUPPLIERS PROVIDING CALIBRATION

Note: A, B, and C **shall** apply when clause is required.

- A.** Seller **shall** be responsible for the calibration and applicable maintenance of any equipment, tooling, or gauges provided from the Buyer to the seller under this procurement agreement.
- B.** Seller's equipment calibration system **shall** be in accordance with one of the four requirements listed below:
 - 1. MIL-STD-45662A
 - 2. ANSI/NCSL Z540
 - 3. ISO 10012-1
 - 4. ISO 17025
- C.** Seller **shall** provide a data package for each service that meets the requirements of the above standards including as found and final results, acceptance criteria, and traceability to applicable national standards.

Q120 MAINTENANCE SERVICES REQUIREMENTS

Note: A, B, C, D, and E, **shall** apply when clause is required.

- A.** Seller **shall** be responsible for the maintenance of any equipment provided to seller under this procurement agreement and as defined in the manufacturer's manuals, warranty agreement and/or Return Material Authorization (RMA) agreement.
- B.** Seller's repair will use equipment that is calibrated and **shall** be in accordance with Q110.
- C.** Seller **shall**, as a minimum, maintain any equipment provided by the seller under the same terms, conditions and quality clauses as the original purchase, including the use of qualified processes and personnel as designated in the manufacturer's manual unless otherwise specified by the maintenance purchasing agreement.
- D.** Seller, during the maintenance/repair, **shall** be in accordance with Q001, Para. A.
- E.** Upon completion of the maintenance/repair, the Seller **shall** prepare a data package providing evidence that the maintenance was performed as required, including the nature of the actions performed and acceptance results. Handling and storage should be as specified in Q001, Para. L.

Q130 SERVICE REQUIREMENTS

Note: A and B **shall** apply when clause is required.

- A.** The Seller **shall** establish and implement a service plan that includes:
1. Provisions for ensuring personnel performing the service have the education, experience, knowledge and/or combination to successfully deliver the service.
 2. Key measures of service performance including action thresholds. Key measures to be used to gauge the consistency, efficiency and effectiveness of the service being provided.
 3. Specific actions to take when performance measurements indicate that the service is not meeting expectations.
 4. A means to obtain and incorporate customer feedback on service performance.
 5. A method to continually improve the level of service.
- B.** The Seller **shall** institutionalize the service plan as part of their standard management system.

Q140 MATERIAL OUTGOING TO SELLER (CUSTOMER FURNISHED PROPERTY)

Note: A, B, C, and D **shall** apply when clause is required.

- A.** Materials furnished to Seller, by Buyer, **shall** require accountability by Seller.
- B.** Materials **shall** be stored and handled in such a manner to ensure the integrity of the material is maintained.
- C.** Seller **shall** obtain direction from Buyer's Procurement concerning the disposition of rejected and/or unused quantities, or usable trimming remaining at the end of the procurement activity.
- D.** Seller **shall** be responsible for maintaining records of identity and the assurance of continued suitability of the tooling, test equipment, etc., while such materials are in their possession.
 - 1. Return of the equipment **shall** be arranged through Buyer's Procurement.

Q150 DROP SHIP

Note: A and B **shall** apply when clause is required.

- A.** Seller **shall** deliver parts/material to address identified on the Purchase Order / Subcontract.
- B.** A copy of all required documentation **shall** be sent to Buyer for receipt and review.

Q200 SOURCE INSPECTION

Source inspection is required prior to shipment of articles from the Seller's facility. Upon receipt of this Order and prior to commencing work, promptly notify the Buyer's Quality Assurance Representative so the appropriate inspection plan can be coordinated.

1. Buyer shall be present to perform source inspection at Seller's facilities or where designated in the Purchase Order / Subcontract prior to shipment.
2. Inspection and test of the articles defined in this contract shall be performed by Seller, and shall be subject to witnessing by Buyer.
3. Seller shall provide reasonable inspection facilities for Buyer to verify conformance to requirements.
4. Seller shall provide all applicable drawings, specifications, procedures, statements of work, Customer's Order, test software, changes, and inspection/test data and reports to Buyer's Source Inspector indicating which characteristics, parameters, dimensions, etc., were actually tested/inspected for validation to Buyer's specification/drawing requirements.
5. After Buyer's Source Inspection, any rework or test of the item, including any nonscheduled entry, such as removal of a panel, cover, or enclosure shall void the source inspection.
6. For any nonscheduled entry, rework, or test, Seller shall request Buyer to repeat source inspection.
7. Buyer's purchasing department shall be notified at a minimum of five (5) workdays prior to commencement of these activities to allow for arrangements for Buyer's quality representative to be present during inspection and test.

Q210 BUYER IN-PROCESS INSPECTION

1. Buyer shall perform in-process inspection at Seller's facilities.
2. Seller shall submit to Buyer an inspection plan or traveler designating in-process source inspection points.
3. Buyer shall designate required in-process source inspection points and inform Seller in writing.
4. Seller shall provide reasonable inspection facilities for Buyer to verify conformance to requirements.
5. After Buyer's Source Inspection, any rework or test of the item, including any nonscheduled entry, such as removal of a panel, cover, or enclosure shall void the source inspection.
6. For any nonscheduled entry, rework, or test, Seller shall request Buyer to repeat source inspection.
7. Seller shall notify Buyer at a minimum of 48 hours prior to the time in-process inspection coverage is required.

Q220 BUYER PRECAP INSPECTION

Items in the procurement document shall require pre-cap inspection by Buyer's Quality Engineering subsequent to the 100 percent pre-cap visual inspection performed by Seller.

Q230 BUYER SOURCE SURVEILLANCE

1. Buyer's Quality Engineering or delegate **shall** perform surveillance at Seller's facilities during the contract period.
2. Surveillance **shall** be scheduled by Buyer, and coordinated with Seller prior to implementation.
3. Surveillance activities **shall** include all functional areas necessary for Buyer to verify the quality of the procured product.

Q240 U.S. GOVERNMENT SOURCE INSPECTION

For procurements made under U.S. Government contracts, the U.S. Government shall have the right to inspect any and all of the work included in the procurement document, at Seller's facilities or at sub-tier supplier's facilities. Seller quality control or inspection system and manufacturing processes are subject to review, verification, and analysis by authorized U.S. Government representatives.

- A.** U.S. Government source inspection shall be required prior to shipment from Seller's facility.
- B.** Upon receipt of this procurement document, Seller shall immediately notify and provide a copy of the procurement document to the U.S. Government representative, who normally services Seller's facility, so appropriate planning for U.S. Government source inspection can be accomplished.
- C.** If a U.S. Government representative does not normally service Seller's facility, the nearest Army, Navy, Air Force, or Defense Agency inspection Office shall be contacted.
- D.** In the event a U.S. Government representative cannot be contacted, Buyer shall be notified immediately.
- E.** Seller, without additional charge to the procurement document, shall provide all reasonably required facilities and assistance for the convenience and safety of the U.S. Government representatives in the performance of their duties.

Q250 ELECTRONIC SOURCE INSPECTION

1. Seller **shall** provide electronic source inspection.
2. Electronic source inspection **shall** consist of photos sent to Buyer via electronic media. Test data **shall** also be sent electronically when Q040 is required on the Purchase Order / Subcontract.
3. Buyer **shall** review and provide authorization to ship predicated on the inspection results.

Q300 INSPECTION / TEST DATA

Note: A and B **shall** apply when clause is required.

- A.** When Buyer's specifications or procurement document require test data to be recorded during the performance of acceptance testing, a paper or preferably electronic copy of the recorded data, showing evidence of Seller's inspection and verification of performance, **shall** accompany each shipment.
- B.** Data **shall** meet the requirements of Buyer's specifications or procurement document and, at a minimum, be identified with:
 - 1. Buyer's Purchase Order / Subcontract number and change notice number
 - 2. Part number
 - 3. Lot numbers, serial numbers, or date codes of items tested.
 - 4. Drawing/specification and revision used.
 - 5. Type of test performed.
 - 6. Identification number of test equipment used.
 - 7. Total quantity of items tested, quantity of items accepted, and quantity of items rejected.
 - 8. Any codes, keys, or other information necessary to interpret Seller data.

Q310 FIRST ARTICLE INSPECTION

Note: A, B, C, and D **shall** apply when clause is required.

- A.** Inspection and acceptance by Buyer of the first article manufactured against this part number **shall** be required prior to delivery to Buyer.
- B.** Seller **shall** submit a First Article Report to Buyer demonstrating compliance with the requirements in the Purchase Order / Subcontract and referenced documents (refer to AS9102 and ASME Y14.41 for guidance).
 - 1. The report **shall** reflect 100 percent inspection verification of all drawing characteristics.
 - 2. The report **shall** delineate each drawing characteristic and specify the corresponding actual measurement results.
 - 3. The report **shall** provide evidence of acceptance by the Seller's authorized Quality Assurance representative.
- C.** Seller **shall** afford the Buyer the opportunity to witness the performance of First Article Inspection/Testing.
- D.** The FAI requirement, once invoked, **shall** continue to apply even after initial compliance. Any or all of the following events requires re-accomplishment of a full, or a delta/partial FAI for affected characteristics:
 - 1. A change in the design affecting form, fit, or function of the part.
 - 2. A change in manufacturing source(s), processes, assembly line, inspection method(s), location, tooling, or materials.
 - 3. A change in numerical control program or translation to another media.
 - 4. A natural or man-made occurrence which may adversely affect the manufacturing process.
 - 5. All repeat builds on production parts when more than two years has elapsed (or as otherwise directed in the purchase order) since the last production item was produced.
 - 6. When required as part of corrective action for a part number with repetitive rejection history.

Q320 SELLER INSPECTION REPORTING REQUIREMENTS

Note: A, B, C, and D **shall** apply when clause is required.

- A.** Seller **shall** submit, with each shipment of items, one copy of an inspection report reflecting 100 percent inspection verification of all drawing characteristics, including notes, for all products.
- B.** The report **shall** delineate each drawing characteristic and specify the corresponding actual measurement results.
- C.** Inspection record traceability **shall** be maintained by either serializing each item, if allowed, or tag identification. The item identification is then matched with the corresponding inspection report.
- D.** The only exception to the above procedure applies to items machined under tape-controlled or automatic conditions. In that case, the 100 percent inspection report **shall** be limited to the first and last item procured from one continuous set-up.
 - 1. The inspection report shall state that the items were machined under tape-controlled or automatic conditions.

Q330 INSPECTION DATA FOR CRITICAL TO FUNCTION DRAWINGS

- A.** Model-Based Product Defined designs and CTF drawings **shall** require recorded data for all defined critical dimensions per ASME Y14.41.

Q340 RADIOGRAPHIC / COMPUTER TOMOGRAPHY INSPECTION

Note: A, B, C, D, and E **shall** apply when clause is required. Exclusion of B or C is acceptable based on inspection method.

- A.** Seller shall be approved by Buyer to perform the radiographic/computer tomography inspection applicable to this procurement document or **shall** use a facility approved by Buyer.
- B.** Unless otherwise specified by the parts specification, each radiograph **shall** comply with ASTM E 1742 “Radiographic Examination”, MIL-STD-883 “Test Method and Procedures for Microelectronics”, and MIL-STD-750 “Test Method for Semiconductor Devices”.
- C.** Unless otherwise specified by the parts specification, computer tomography **shall** comply with ASTM-E1441 “Standard Guide for Computer Tomography Imaging”.
- D.** The radiographic film / image and a copy of the report **shall** accompany the shipment of the items to Buyer.
- E.** Serial number location and x-ray position **shall** be recorded as part of, or attached to, the report.

Q350 END ITEM DATA PACKAGE (EIDP)

- A.** An End Item Data Package (EIDP) **shall** be developed, maintained, provided and/or delivered at or before final acceptance of product by the Buyer, which incorporates the following information:
1. Seller Certificate of Conformance (refer to Q020)
 2. Specification/drawing number and revision
 3. As-built configuration (Indented Parts List – may not be required for software)
 4. Proof of traceability requirements compliance (serial numbers, lot numbers, batch number, software version, etc.)
 5. Documented non-conformances
 6. Documented open action items
 7. Incorporated Change Orders (Engineering Change Proposals (ECPs))
 8. Certificate of Conformances from sub-tier suppliers with objective evidence to validate the certificates
 9. Type of inspection performed and recorded results
 10. Type of test performed and recorded results
 11. Total quantity of items tested, quantity of items accepted, and quantity of items rejected
 12. Applicable Government Industry Data Exchange Program (GIDEP) alerts, waivers, deviations, and incident reports
 13. Verification of compliance with useful life requirements, e.g., total operating time, thermal cycles, vibration time
 14. Certificate of Traceability if invoked on the Purchase Order / Subcontract
- B.** Buyer **shall** refuse to accept item if Seller fails to submit certifications, documentation, test data, or reports specified in the procurement document. Documentation **shall** include Buyer's source inspection if such source inspection is performed.
- C.** Written approval **shall** be obtained from Buyer for any deviations to the EIDP.

Q400 SPACE FLIGHT SOLDER WORKMANSHIP STANDARD

- A.** Soldering and processing of electronic assemblies **shall** be in accordance or equivalent with J-STD-001 “Space and Military Applications Electronic Hardware Addendum”.

Q410 PCBA SOLDER WORKMANSHIP STANDARD

- A.** Soldering and processing of electronic assemblies shall be in accordance or equivalent with IPC-A-610 “Acceptability of Electronic Assemblies” or J-STD-001 “Requirements for Soldered Electrical and Electronic Assemblies”.

Q420 CABLE WORKMANSHIP STANDARD

- A.** Workmanship shall be in accordance with IPC/WHMA-A-620 “Requirements and Acceptance for Cable and Wire Harness Assemblies”.

Q430 PRINTED CIRCUIT BOARD STANDARD

Note: A and B **shall** apply when clause is required.

- A.** Printed Circuit Boards fabricated under this Purchase Order / Subcontract **shall** comply with the requirements of IPC-A-600 “Acceptability of Printed Boards”, IPC-6011 “Generic Performance of Printed Boards”, and IPC-6012 “Qualification and Performance Specification for Rigid Printed Boards”.
- B.** Coupons **shall** be included if defined on the drawing with each shipment.

Q440 TEST COUPON

- A.** Test coupons **shall** be provided per the specification for each shipment.

Q450 PRINTED CIRCUIT BOARD TESTING

Note: A and B shall apply when clause is required.

- A.** Unless otherwise specified in Engineering Requirements Documentation, Seller **shall** perform bare board testing with these values: Test voltage -10–250V, continuity 10 ohm maximum, insulation resistance 10K ohm minimum.
 - 1. Acceptable boards **shall** be acceptance stamped.
 - 2. Rejected boards **shall** be identified with the from/to path of failure and annotated either short or open.
 - 3. Seller **shall** not repair.
- B.** Automated electro-optical inspection **shall** be required with this order if the boards have 4 or more layers.
 - 1. Layer defects **shall** be reported to Buyer for authorization to repair.

Q460 SOLDERABILITY

Note: A, B, and C shall apply when clause is required.

- A.** Material submitted with each shipment **shall** have had solderability testing performed in accordance with one or more of the following specifications:
1. MIL-STD-750, Method 2026
 2. MIL-STD-883, Method 2003
 3. MIL-STD-202, Method 208
 4. MIL-P-55110
 5. MIL-P-50884
 6. J-STD-001
 7. J-STD-002
 8. J-STD-003
- B.** Seller **shall** supply a copy of the certification by an accredited agency to one or more of the specifications listed in paragraph A with each order.
- C.** If, during the life of that Purchase Order / Subcontract, the certification is revoked or the certification expires, all efforts against this Purchase Order / Subcontract **shall** be stopped.
1. Buyer **shall** be notified in writing within twenty-four hours.

Q470 ELECTROSTATIC DISCHARGE CONTROL

Note: A, B, C and D **shall** apply when clause is required.

- A.** Seller **shall** provide and maintain a program for Electrostatic Discharge (ESD) control for hardware items to be furnished for this procurement in accordance with ANSI-S20.20 Parts, Electrical and Electronic, Assemblies and Equipment, Protection of (excluding Electrically Initiated Explosive Devices), for the Development of an Electrostatic Discharge Control Program.
- B.** Seller's ESD control program **shall** be subject to review and approval by Buyer.
- C.** Items **shall** be packaged with ESD protective material.
 - 1. ESD protective caps **shall** be used on equipment external connectors or contacts that connect to ESD parts and assemblies within the equipment.
 - 2. All packages **shall** be identified with a suitable precautionary label.
- D.** Any ESD components or assemblies received by Buyer that are not in an ESD protective material **shall** be subject to return to Seller. **NOTE:** ESD requirements are defined as applicable to any active or passive components.

Q480 CONTAMINATION / FOREIGN OBJECT DEBRIS (FOD) CONTROL

Note: A, B, C and D shall apply when clause is required.

- A.** Seller **shall** maintain a FOD prevention program.
- B.** Seller's FOD prevention program **shall** include the review of design and manufacturing processes to identify and eliminate foreign object entrapment areas and paths through which foreign objects can migrate.
- C.** Buyer **shall** have the right to perform inspections, verifications, and FOD prevention program audits at Seller's facility to ensure program documentation and effectiveness.
- D.** Articles ordered under this Purchase Order / Subcontract **shall** be protected by Seller from contamination or damage from foreign objects during processing, testing, inspection, handling, and packaging prior to delivery to Seller.

Q500 PROHIBITED MATERIALS LIST (SPACE HARDWARE)

Prohibited Materials will not be used the platings, coatings, or claddings used in the construction of products for use in a space environment. Acceptance limits for Prohibited Materials scanning, including guard bands allowing for handheld XRF instrument accuracy limitations, for prohibited elements and alloys are as follows:

Material	Description
Pure Tin (Sn)	Any tin alloy with >97.0 wt% Sn or < 3.0 wt % lead (Pb)
Cadmium (Cd) Plating	Any alloy with >5.0 wt% cadmium, generally used as a galvanic coating on steel
Zinc (Zn) Plating	Any alloy with >5.0 wt% zinc, generally used as a galvanic coating on steel
Unplated Brass	Any alloy primarily of copper and zinc with a zinc content >15.0 wt% without an approved plating over the entire surface

Q510 PROHIBITED MATERIAL (EEE PARTS)

Note: Buyer will specify A and/or B. C shall apply when clause is required.

- A.** All constructions and finishes containing pure cadmium or pure zinc **shall** be prohibited.
- B.** Constructions and finishes containing pure tin, tin-bismuth (SnBi), tin-silver (SnAg), tin-silver-copper (SnAgCu) or solders containing tin with less than 3% lead (Pb) content **shall** be prohibited.

Exceptions are allowed for the following Pb-free solders: Sn96Sb4, Sn95Sb5, Sn96Ag4, and Sn95Ag5 only for high temperature solder attach applications.

- C.** Seller **shall** submit a certificate with each shipment stating that no prohibited materials are present in their deliverable product.

Q520 PREFERENCE FOR DOMESTIC SPECIALTY METALS

Specialty metals are prohibited from being incorporated into military parts, components and/or end item deliverables unless the specialty metals have been smelted (the Deviation clause adds “or produced”) in the United States, its outlying areas, or a qualifying country listed in DFARS 225.872-1.

Exemptions to the requirements of the above clauses may exist, as outlined in the clauses themselves or by operation of applicable Department of Defense (DoD) Domestic Non-Availability Determinations (DNADs) posted on the DoD public web site. If you believe an exemption(s) applies, please provide the specifics to CesiumAstro with the appropriate documents and information sufficient to demonstrate your entitlement.

Q530 SURFACE FINISH ACCEPTANCE CRITERIA

Supplied product with surface finishes for functional or cosmetic applications shall be uniform in appearance, free from blisters, lifting or peeling coating, pits, nodules, scratches, stains, cracking or any other defect. This includes but is not limited to electroplated, conversion coated, anodized, painted, mechanically finished and passivated surfaces.

Q600 COUNTERFEIT MATERIAL CONTROL

It is CesiumAstro's policy to purchase product(s) only directly from the manufacturer or from their authorized distributors. Purchasing product(s) from brokers or Independent Distributors is prohibited.

1. Definitions

- a. "Counterfeit Product" means product that is an unlawful or unauthorized reproduction, substitution, or alteration that has been knowingly mismarked, misidentified, or otherwise misrepresented to be authentic, unmodified product from the original Manufacturer, or provided by a source without the express written authority of the original Manufacturer or current design activity, including an unauthorized aftermarket Manufacturer. Included is used product represented as unused or falsely identified by grade, serial number, lot number, date code, or performance characteristics.
- b. "Independent Distributors" are persons and businesses that are not part of the Manufacturer's authorized distribution chain. These also may be referred to as non-franchised distributors, unauthorized distributors or brokers.
- c. "Suspect Counterfeit Product" means product for which credible evidence (including, but not limited to, visual inspection or testing) provides reasonable doubt that the product is authentic.

2. Requirements

- a. The Supplier warrants they are authorized by the product Manufacturer(s) to distribute the product(s) provided to CesiumAstro.
- b. The Supplier shall include a copy of the Manufacturer's Certificate of Compliance and/or Certificate of Analysis along with the Supplier's Certificate of Compliance with each product shipment.
- c. The Supplier warrants that product(s) supplied to CesiumAstro are new, unused, authentic, genuine and legitimate.
- d. Suppliers that procure and integrate EEE parts into products supplied to CesiumAstro shall implement the avoidance, detection, mitigation and disposition requirements of AS5553. Distributors of EEE parts should be AS6081 certified.
- e. Suppliers shall notify CesiumAstro in a reasonable time if a part is reported to be going obsolete.

Q700 CONTROL OF SOFTWARE

Note: Select any combination of A, B, and C that apply.

A. SOFTWARE QUALITY PROGRAM

1. Seller **shall** establish a Software Quality Assurance Program that conforms to the standards specified.
 - a. AS9006, Deliverable Aerospace Software Supplement for AS9100,
 - b. ISO/IEC 12207, Software Life Cycle Processes,
 - c. Capability Maturity Model Integration (CMMI) - Level 3 or higher.

B. SOFTWARE DELIVERY DOCUMENTATION

1. Seller **shall** deliver software documentation as specified in the procurement document.
2. Software documentation **shall** be sufficient to ensure:
 - a. All requirements are achieved or waivers are submitted.
 - b. Configuration is correct and deliverables are properly identified and marked.
 - c. Planned level of acceptance is achieved and/or approved deviation/waivers are made part of the deliverable documentation package.
 - d. Operating instructions accompanying the developed software are sufficient to enable loading, initialization, and operation by Seller's personnel.

C. CONTROL OF SOFTWARE

1. Seller **shall** provide and maintain a system for the control of software used in the fabrication, qualification/acceptance testing of deliverable hardware, software, and firmware to be furnished for this procurement.
2. Seller **shall** maintain procedures and test records for items delivered to Buyer and these records **shall** be available for Buyer review.