CESIUM ASTRO

SPACE & DEFENSE SYSTEMS

Supplier Quality Notes

PL-QA-001
Revision H

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B	01-MAR-2024	Updated Q500 and Q510 for prohibited materials criteria. Updated CesiumAstro logo.	Dean Melendrez
C	01-JUL-2024	Added Q800-Q830 that cover export control, DFARS and US Government clauses.	Dean Melendrez
D	08-OCT-2025	Added Q490 for red & white plague requirements per CAR-000290.	Brendan Cunningham
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H	18-Nov-2026	Added COTS to Abbreviations. Added Q080 SMT Component Packing. Clarified Q300.	Jasmine Fanta

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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 flows down to suppliers whenever it needs to procure goods & services in accordance with Procurement (PR-PRC-001). 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

This policy 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 provides an end product or service which forms part of a product or service required by CesiumAstro meets the appropriate quality requirements. This information is 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) Supplier Quality Notes (this document).

2. REFERENCES

2.1 Definitions

Buyer	CesiumAstro Procurement entity (also known as the Buyer/Subcontract Administrator)
Seller	The legal entity that is the contracting party with the Buyer with respect to the procurement document. (also known as Manufacturer, Supplier, Vendor, Distributor, Subcontractor)
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
CoC	Certificate of Conformance
COTS	Commercial Off-the-Shelf
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
ETFE	Ethylene Tetrafluoroethylene
FOD	Foreign Object Debris
GIDEP	Government Industry Data Exchange Program
ISO	International Organization for Standardization
MIL	Military
MRB	Material Review Board
NADCAP	National Aerospace and Defense Contractors Accreditation Program
NASA	National Aeronautics and Space Administration
NIST	National Institute of Standards and Technology
OCM/OEM	Original Component Manufacturer/Original Equipment Manufacturer
QMS	Quality Management System
QPL	Qualified Parts List
SCAR	Supplier Corrective Action Request
SDS	Safety Data Sheet
SEI	Software Engineering Institute
SEM	Scanning Electron Microscope
SQE	Supplier Quality Engineer
UID	Unique Identification

2.3 Reference Documents

PR-PRC-001	Procurement

3. SUPPLIER QUALITY REQUIREMENTS

Q002 Safety Data Sheets (SDS)

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). Containers **shall** be clearly marked as to its contents with appropriate warnings, precautions, instructions, and storage conditions. An SDS **shall** be included with the shipment documents.

Q003 Limited Life Material

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. 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.

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.

In no case **shall** materials or articles be supplied to Buyer with less than 50 % of its useful life and no less than 60 days of its useful life remaining, unless Cesium Astro procurement documentation specified otherwise. The minimums of 50% and 60 days of useful life apply on the date of shipment.

Q004 GIDEP Alerts

Seller **shall** participate in the Government-Industry Data Exchange Program (GIDEP). Seller **shall** review all GIDEP alerts, advisories and agency action notices to determine if they affect the Seller's products/services. For those that affect the Seller's products/services, the Seller **shall** take action to eliminate or mitigate any impacts and **shall** notify the Buyer of any that pertain to items provided on this PO.

Q010 Sub-Tier Quality Management System (QMS) – ISO 9001

Seller **shall** only use sub-tier suppliers that have an ISO 9001 registered QMS. In the event that use of a registered sub-tier supplier is not possible, the Seller **shall not** use the supplier without approval from the Buyer first. The Buyer **shall** reserve the right to conduct an assessment of the sub-tier supplier's QMS.

Q011 Sub-Tier Quality Management System (QMS) – AS9100

Seller **shall** only use sub-tier suppliers that have an AS9100 registered QMS. In the event that use of a registered sub-tier supplier is not possible, the Seller **shall not** use the supplier without approval from the Buyer first. The Buyer **shall** reserve the right to conduct an assessment of the sub-tier supplier's QMS.

Q020 Certificate of Conformance

A Certificate of Conformance (CoC) **shall** be provided with each shipment stating that the items/services provided are in conformance with the requirements of the Buyer's purchase order/contract/specifications/drawing (as applicable).

The following information at a minimum **shall** be provided:

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. Lot/Batch/Date Code
4. Quantity shipped

The Certification of Conformance **shall** be signed by Seller's duly authorized representative.

Q030 Raw Material Documentation

Shipment of materials, whether raw, semi-finished, or finished, **shall** be accompanied by a Certificate of Conformance and/or test report 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.

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

Q035 XRF Test Report

Shipment of materials, **shall** be accompanied by a Certificate of Conformance and XRF test report from Seller (for external surfaces only), stating at a minimum:

- Verification that materials are free of exposed base metal, platings, coatings and claddings composed of cadmium, brass, zinc, tin (pure tin (Sn), tin-bismuth (SnBi), tin-silver (SnAg), tin-silver-copper (SnAgCu)) or solders containing tin with less than 3% lead (Pb) content. Exceptions are allowed for the following Pb-free solders.
    - Sn96Sb4, Sn95Sb5, Sn96Ag4, and Sn95Ag5 only for high temperature solder attach applications.
- Sample testing **shall** be done based on 2.5% AQL Sampling Plan, Zero-Based Acceptance:

Lot Size	Sample Size
1 to 4	100%
5 to 50	5
51 to 90	7
91 to 150	11
151 to 280	13
281 to 500	16
501 to 1,200	19
1,201 to 3,200	23
3,201 to 10,000	29
10,001 to 35,000	35
≥ 35,001	40

Q040 Control of Special Processes

Any special process by supplier requires NADCAP certification. Any exceptions require written approval by CesiumAstro Quality.

Q045 Certificate of Special Processes

All special process suppliers utilized on this purchase order/subcontract require current certification by NADCAP or approval by CesiumAstro Quality at the time of processing. NADCAP accredited suppliers can be found on the QML listing at www.eauditnet.com.

Supplier **shall** provide a Certificate of Conformance with each delivery, which may be included in the CoC for clause Q020. Material will only be accepted if the standard/specification shown on the Certificate of Conformance matches the standard/specification stated in the scope of the Special Processor's accreditation. When utilizing NADCAP accredited suppliers for Brazing, Welding, NDT and/or Composites, supplier's scope of accreditation will list Special Process methods, rather specific specifications (e.g. Fusion Welding, Vacuum Brazing, Dye Penetrant, etc.). The Certificate of Conformance **shall** also contain the following:

- Name and address of each Special Process supplier used.
- Special Process specification used and all relevant information (e.g., type, class, chemical composition, treatment times, etc.).
- CesiumAstro part number (CPN) (when available) including variant conditions and revision.

Processing accomplished in performance of this purchase order is directly related to a CesiumAstro purchase order and **must** be performed in accordance with process specification(s) on all associated procurement documents. Special Process sub-tiers **shall** confirm that they are either NADCAP accredited or CesiumAstro approved prior to performing any processing associated with this purchase order.

Q050 Calibration System Requirements

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.

Standards used for equipment calibration **shall** be traceable to National Institute of Standards and Technology (NIST) standards. Seller's equipment calibration system **shall** be in accordance with one of the standards listed below:

- ANSI/NCSL Z540.1
- ANSI/NCSL Z540.3
- ISO 17025
- ISO 9001
- AS9003
- AS9100
- MIL-STD-45662A

The Seller **shall** notify the Buyer of any changes to their registration status.

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
Assemblies	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/EEE Parts	Traceability through supply chain to Original Equipment Manufacturer (OEM).
Modified Off-The-Shelf (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.

Q070 Single Lot Date Code

Seller **shall** provide part number under this purchase order with a single lot/date code per package. CesiumAstro will accept multiple date codes in a shipment as long as each lot/date code is individually packaged and labeled.

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. When mixed lot/date codes are authorized which could be applicable for a certain serialized parts, the shipper **shall** list individual lot/date codes and quantity.

Q080 SMT Component Packing

Seller **shall** ensure that all components intended for Surface Mount Technology (SMT) automated assembly are supplied in tape-and-reel or JEDEC Matrix Tray packaging suitable for automated pick-and-place equipment.

Tape-and-reel packaging **shall** comply with applicable EIA-481 standards and shall adequately protect components from damage during shipping, handling, and storage.

Alternative packaging methods, including cut tape, bulk, or tray packaging, **shall not** be permitted without prior written approval from the Buyer and Manufacturing Engineering Manager or delegate, and should only be considered after receiving a quote from a 3rd party repackaging supplier.

Q100 Requirements for Distributors

Note – If OEM/non-distributor, this requirement is waived.

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.

The Distributor Certificate of Conformance **shall** include the following information:

- Part number
- Applicable traceability information (date code and/or lot code, country of origin)
- Results of testing or special inspection, as required.
- Items identified by Buyer number **shall** have complete information as to the original manufacturer and original manufacturer's part number.

The Distributor **shall** provide documented traceability and unbroken Chain of Custody from the OCM/OEM to the Seller. This **should** be accomplished by providing the OEM CoC to the Buyer.

In absence of the OEM CoC, the following information **shall** be provided:

- Applicable traceability information as stated above.
- Packing list or sales order document showing delivery and acceptance from OEM to Seller.
- Evidence that the Seller is an authorized distributor of the OEM's parts

Q110 Requirements for Suppliers Providing Calibration Service

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. Seller's equipment calibration system **shall** be in accordance with one of the requirements listed below:

- ANSI/NCSL Z540.1
- ANSI/NCSL Z540.3
- ISO 17025
- ISO 9001
- AS9003
- AS9100
- MIL-STD-45662A

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

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.

Seller's repair will use measurement equipment that is calibrated and **shall** be in accordance with Q110. 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.

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.

Q130 Service Requirements

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.

Q140 Material Outgoing to Seller (Customer Furnished Property)

Materials furnished to Seller, by Buyer, **shall** require accountability by Seller. Materials **shall** be stored and handled in such a manner to ensure the integrity of the material is maintained.

Seller **shall** obtain direction from Buyer's Procurement concerning the disposition of rejected and/or unused quantities, or excess material remaining at the end of the procurement activity.

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. Return of the equipment **shall** be arranged through Buyer's Procurement.

Q150 Drop Ship Material

Seller **shall** deliver parts/material to the address identified on the Purchase Order / Subcontract. All documentation received from the sub-tier supplier **shall** be sent to Buyer for review and approval prior to proceeding with processing. Seller is responsible for all requirements delivered both directly from the buyer and those delivered to the sub-tier.

Q200 Final 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.

The following apply:

1. Buyer **shall** be present to perform source inspection at Seller's facilities or where designated in the Purchase Order / Subcontract prior to shipment. A remote inspection via photo/video **shall** only take place if agreed upon between the Seller and Buyer in advance.
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 In-Process Source Inspection

Source inspection is required during processing at 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. The following apply:

1. Buyer **shall** perform in-process inspection at Seller's facilities. A remote inspection via photo/video **shall** only take place if agreed upon between the Seller and Buyer in advance.
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.

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. The following apply:

1. U.S. Government source inspection **shall** be required prior to shipment from Seller's
2. facility.
3. 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.
4. If a U.S. Government representative does not normally service Seller's facility, the
5. nearest Defense Agency inspection Office **shall** be contacted.
6. In the event a U.S. Government representative cannot be contacted, Buyer **shall** be notified immediately.
7. 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.

Q300 Inspection / Test Data

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, demonstrating evidence of Seller's inspection and verification of performance, **shall** accompany each shipment.

Exemption: This requirement does not apply to items classified as COTS.

For applicable non-COTS items, 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

Inspection and acceptance by Buyer of the first article manufactured against this part number **shall** be required prior to delivery to Buyer. 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).
The report **shall** contain at a minimum:

1. 100 percent inspection verification of all drawing characteristics.
2. Delineation of each drawing characteristic and specify the corresponding actual measurement results.
3. Evidence of acceptance by the Seller's authorized Quality Assurance representative.

Seller **shall** afford the Buyer the opportunity to witness the performance of First Article Inspection/Testing.

The FAI requirement, once invoked, **shall** continue to apply even after initial compliance. Any or all of the following events require a reperformance 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 have 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

Seller **shall** submit, with each shipment of items, one copy of an inspection report reflecting 100 percent inspection verification of all drawing characteristics. The report **shall** delineate each drawing characteristic and specify the corresponding actual measurement results.

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.

The only exception to the above requirements 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. The inspection report **shall** state that the items were machined under tape-controlled or automatic conditions.

Q330 Inspection data for Critical to Function Drawings

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

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.

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”.

Unless otherwise specified by the parts specification, computer tomography **shall** comply with ASTM-E1441 “Standard Guide for Computer Tomography Imaging”.

The radiographic film / image and a copy of the report shall accompany the shipment of the items to Buyer.

Serial number location and x-ray position **shall** be recorded as part of, or attached to, the report.

Q350 End Item Data Package (EIDP)

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 (Indentured 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

Buyer reserves the right to 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. Written approval **shall** be obtained from Buyer for any deviations to the EIDP.

Q460 Solderability

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

Q470 Electrostatic Discharge Control

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/ESD-S20.20. Seller's ESD control program **shall** be subject to review and approval by Buyer.

Items **shall** be packaged with ESD protective material and compliant with the following:

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.

Any ESD components or assemblies received by Buyer that are not in an ESD protective material **shall** be subject to return to Seller.

Q480 Contamination / Foreign Object Debris (FOD) Control

Seller **shall** maintain a FOD prevention program. 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.** Buyer **shall** have the right to perform inspections, verifications, and FOD prevention program audits at Seller's facility to ensure program documentation and effectiveness.

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.

Q490 Red/White Plague Control

Materials on this purchase order contain silver-plated copper wire and/or fluoropolymer insulation (ETFE, in particular), which present a risk of the conditions known as red plague and white plague, respectively. Seller **shall** comply with the following mitigation plans in accordance with IPC J-STD-001 XS, IPC-WP-113, and IPC-WP-114, as applicable:

- Red Plague
    - Exposed ends of silver-plated copper wires **shall** be capped with heat shrinkable end-caps or dipped in insulating electrical varnish for a length of approximately 1in. before placing in storage. Silver-plated copper materials **shall** be stored in moisture barrier bags (MBB) and include humidity indicator cards.
- White Plague
    - ETFE-insulated wire and cable **shall** be stored in packaging that is vented to prevent buildup of hydrogen fluoride inside the packaging. The packaged ETFE-insulated wire or cable **should** be stored in a humidity-controlled environment.
    - The rate of fluorine evolution (outgassing) of the insulation jacket(s) **shall not** exceed 20 PPM when tested in accordance with AS4373 Method 608, Fluoride Offgassing.
    - ETFE and XL-ETFE insulated wire and cable **shall** be subjected to a full or partial vacuum bake at +125 °C [+257 °F] for a period of 24 hours, or a dry nitrogen-purge oven bake at +66 °C to +125 °C [+194 °F to +257 °F] for a minimum of 24 hours, prior to Fluorine Outgassing test in accordance with AS4373 Method 608, Fluoride Offgassing.

Q500 Prohibited Materials List

Prohibited Materials **shall not** be used in the construction of products for use in a space environment. Seller **shall** submit a certificate with each shipment stating that no prohibited materials are present in their deliverable product. Acceptance limits for Prohibited Materials scanning, including guard bands allowing for handheld XRF instrument accuracy limitations, for prohibited elements and alloys are as follows:

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Material	Description
Pure Tin (Sn)	Unalloyed tin or any tin alloy where tin is greater than >97.0 wt.% Sn and the remainder is lead, is prohibited. Tin with less than 97% tin and the remainder is lead is acceptable. Reflowed pure tin is not acceptable. Exceptions are allowed for the following Pb-free solders: SAC305, Sn96Sb4, Sn95Sb5, Sn96Ag4, and Sn95Ag5 only for high temperature solder attach applications.
Beryllium oxide	No amount allowed
Cadmium (Cd) Plating	Pure cadmium and any alloy with >5.0 wt.% Cd.
Zinc (Zn) Plating	Pure zinc and any alloy with >5.0 wt.% Zn.
Mercury (Hg)	Pure mercury and any alloy with >5.0 wt.% Hg.
Selenium (Se)	Pure selenium and any alloy >5.0 wt.% Se.
Magnesium (Mg)	Pure magnesium or high magnesium alloys with >= 3.o wt.% Mg. Trace amounts of Mg are acceptable in material systems such as Aluminum and Steel alloys.
Unplated Brass	Any alloy primarily of copper and zinc with a zinc content >15.0 wt.% without an approved plating over the entire surface
Corrosive Solder Fluxes	Allowable only if a detailed cleaning procedure that includes verification of cleanliness methods is used.
Silicone	Prohibition mainly applies to sealants, adhesives, lubricants and grease. Solid parts like gaskets that contain silicone are acceptable provided they have been properly baked out.

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.

Definitions:

1. "**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.
2. "**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.
3. "**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.

Requirements:

1. The Supplier warrants they are authorized by the product Manufacturer(s) to distribute the product(s) provided to CesiumAstro.
2. 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.
3. The Supplier warrants that product(s) supplied to CesiumAstro are new, unused, authentic, genuine and legitimate.
4. Suppliers that procure and integrate parts into products supplied to CesiumAstro **shall** implement the avoidance, detection, mitigation and disposition requirements of AS9100, AS9120 or AS5553. Authorized distributors of parts **should** be AS9100, AS9120 or AS6496 compliant.
5. Suppliers **shall** notify CesiumAstro in a reasonable time if a part is reported to be going obsolete.

Q700 Control of Software

Seller **shall** establish a Software Quality Assurance Program that conforms to the standards specified:

1. AS9006, Deliverable Aerospace Software Supplement for AS9100,
2. ISO/IEC 12207, Software Life Cycle Processes,
3. Capability Maturity Model Integration (CMMI) - Level 3 or higher.

Seller **shall** deliver software documentation as specified in the procurement document. Software documentation **shall** be sufficient to ensure:

1. All requirements are achieved or waivers are submitted.
2. Configuration is correct and deliverables are properly identified and marked.
3. Planned level of acceptance is achieved and/or approved deviation/waivers are made part of the deliverable documentation package.
4. Operating instructions accompanying the developed software are sufficient to enable
5. loading, initialization, and operation by Seller's personnel.

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. Seller **shall** maintain procedures and test records for items delivered to Buyer and these records **shall** be available for Buyer review.

Q800 Export Control

One or more documents used on this Purchase Order contains technical data as defined in 22CFR 120.10 of the International Traffic in Arms Regulations (ITAR) and is subject to the export control laws of the U.S. Government. Transfer of this data by any means to a foreign person, whether in the U.S. or abroad, without an export license or other approval from the U.S. Department of State, is strictly prohibited.

Q810 U.S. Government Contract Clauses

This Purchase Order is a subcontract for commercial items or commercial components to a U.S. Government prime contract, the clauses specified in FAR 52.244-6 and DFARS 252.244-7000 as prescribed by FAR 44.403 and DFAR 244.403, respectively, **shall** apply.

For all other purchase orders, agreements, or transactions, any U.S. Government contract clauses incorporated by reference are only applicable to this subcontract pursuant to the guidelines and prescriptions relating to mandatory flow down contained within the particular clause and based upon the specified contract value or contract type as defined in the FAR, DFARS, and other agency supplements, or other applicable regulatory requirement.

Q820 U.S. Government Sanction Countries and Prohibited Sources

This clause **prohibits** Seller and all Seller's sub-suppliers from incorporating parts or components into military parts, components, systems, subsystems, and/or end item deliverables that have been sourced from listed Office of Foreign Assets Control (OFAC) sanction countries and prohibited sources as defined in DFARS 225.7.

Sanction countries are listed at U.S Department of the Treasury, Office of Foreign Assets Control, https://ofac.treasury.gov/sanctions-programs-and-country-information.

Prohibited sources managed by the U.S. Department of Defense are listed in U.S. General Services Administration website https://www.acquisition.gov/dfars/part-225-foreign-acquisition#DFARS_SUBPART_225.7.

Q830 Buy American Statute

This clause requires that the Seller **shall** ensure end item deliverable to CesiumAstro is a domestic end product as defined by DFARS 225.1 – Buy American – Supplies.

Q840 Foreign COTS Items Prohibition

This clause requires that the Seller **shall not** incorporate COTS or other articles owned or created by foreign governments or entities without CesiumAstro approval.