



**ATK SPACE SYSTEMS
BELTSVILLE, PASADENA AND LANGLEY SITES
QUALITY ASSURANCE CLAUSES**

(For the purposes and clarity of the following clauses, ATK Space - Belt refers to Beltsville MD, Pasadena CA and Langley VA sites and the term Purchase Order or PO is intended to include reference to any ATK Space - Belt Purchase Instrument and shall include Subcontracts.)

The following clauses, when included in the Purchase Order (PO), form a part of the PO as well as all other clauses, terms, conditions, drawings and specifications which are included as part of the PO. These clauses, as they are assigned by the cognizant ATK Space – Belt Quality Assurance Representative for each P.O., shall be printed with their identifier in plain text on the face of the P.O.

Category 1 Certifications and Documentation Required

- 14QC-1A Shipments made against this Purchase Order must include a Certificate of Conformance (C of C). The C of C must contain, as a minimum, the ATK Space - Belt P.O. number, the Part Number, revision level and quantity shipped. In cases where an item is purchased to an ATK Space - Belt or distributor part number, the manufacturer's part number shall also be provided. The C of C shall state that all materials, parts and processes used in manufacturing meet Purchase Order and applicable specification requirements. The C of C must be signed by the supplier's Quality Assurance Representative.
The Certificate of Analysis (C of A) is an acceptable alternate to the C of C, provided it contains traceability to both the delivered lot and to the ATK Space - Belt Purchase Order.
- 14QC-1B Copies of Sub-tier Supplier C of C's must be included with shipment. Each C of C must show written traceability to the ATK Space - Belt P.O. and Part Number. In cases where an item is purchased to a prime-supplier or distributor part number, the original manufacturer's part number shall also be provided.
- 14QC-1C Certificate of Conformance from material Suppliers is required. Traceability to the ATK Space - Belt P.O. must be maintained. The C of C shall include manufacturer of the material and the material lot number.
- 14QC-1D Test Reports: The supplier shall provide actual physical and chemical analysis test reports in accordance with the applicable specifications. For electrical wire or cable, and RF cable, the report shall include electrical inspections and tests in accordance with the applicable specifications. Manufacturer of material and lot number must be identified on each document.
- 14QC-1E The supplier shall supply with each shipment, detailed test, and inspection data as required by the applicable procurement specification. The data must be approved by an authorized Supplier's Quality Assurance Representative. When this clause is imposed, 100% inspection of all characteristics is required. Reports listing actual dimensions traceable to the individual part or lot of parts is required. Reports stating ranges for multiple quantities of like parts are acceptable. These reports shall be traceable to the ATK Space - Belt Purchase Order, and must also include the Part Number and Rev. level, Part Name, and test or Specification Number (when required).



**ATK SPACE SYSTEMS
BELTSVILLE, PASADENA AND LANGLEY SITES
QUALITY ASSURANCE CLAUSES**

- 14QC-1F The supplier shall supply a summary of the test and inspection data as required by the applicable procurement specification with each shipment. Test and Inspection data sheets shall conform to provisions of the applicable specification and shall be traceable to the ATK Space - Belt Purchase Order.
- 14QC-1G Detailed Failure Analysis and Corrective Action is required on all failures which may occur that are associated with the item(s) delivered on this Purchase Order.

Category 2- Supplier Quality System Requirements

- 14QC-2A The Supplier shall provide and maintain a Quality System acceptable to ATK Space - Belt covering items supplied under this contract. Records of all inspections performed under this system shall be retained and made available to ATK Space - Belt upon request. ATK Space - Belt reserves the right to perform surveys and audits as necessary to assure conformance to the Quality Assurance requirements which are a part of this Purchase Order.
- 14QC-2B The Supplier shall have a registered Quality System to meet the requirements of ISO-9001-2000. (ATK Space - Belt may request a copy of the Registration Certificate annually as evidence of continued compliance.)
- 14QC-2C The Supplier shall have a registered Quality System to meet the requirements of AS9100B. (ATK Space - Belt may request a copy of the Registration Certificate annually as evidence of continued compliance.)
- 14QC-2D Suppliers Software Quality System shall be acceptable to ATK Space - Belt. The Software Quality System shall be consistent with ISO 9001-2000, ISO9000-3 or (CMMI Level 2 or higher). ATK Space - Belt reserves the right to perform surveys and audits as necessary to assure conformance to the Software Quality System requirements.
- 14QC-2E The Software Quality System shall be certified to ISO 9001-2000 in accordance with ISO90003 or CMMI Level 2 or higher. Please submit a copy of registration/certification annually.
- 14QC-2F QA Requirements imposed within this P.O. must be 'flowed' to sub-tier Suppliers. The Supplier shall determine the QA requirements that are applicable to the sub-tier Suppliers.
- 14QC-2G The supplier shall maintain documented workmanship standards. Requirements for workmanship standards shall meet the ATK Space - Belt procurement specifications, and best industry practices.
- 14QC-2H Control of Nonconforming Product - MRB authority is not delegated. Non-conforming material shall not be forwarded to ATK Space - Belt without written approval from ATK Space - Belt Purchasing / Subcontracts. The supplier shall notify ATK Space - Belt Purchasing / Subcontracts of all non-conformances in writing. Approval for use may be granted by MRB, and delivery may be authorized with this written approval. Request for shipment approval must be requested for each specific occurrence.



**ATK SPACE SYSTEMS
BELTSVILLE, PASADENA AND LANGLEY SITES
QUALITY ASSURANCE CLAUSES**

14QC-2I Control of Records - Records shall be established and maintained to provide evidence of conformance to the requirements of this purchase order. These records shall remain legible, readily identifiable, and retrievable for a period of 10 years unless a different period is mandated elsewhere in this purchase order / subcontract.

Category 3- Inspection and Marking Requirements

14QC-3A First Article Inspection (FAI) shall be performed by the Supplier in accordance with AS9102. The sample shall have been fabricated using the same parts, materials, processes and location proposed for full production. Reports of acceptable first article inspection shall accompany the first part delivered to ATK Space - Belt and shall include all dimensional measurements and results of all electrical, mechanical and non-destructive inspections and tests. The report shall show that the item meets all requirements. When FAI is imposed, approval of the First Article is required before proceeding with fabrication of the rest of the lot.

14QC-3B First Article inspection shall be performed by the Supplier and verified by ATK Space - Belt at the Supplier's plant before shipment. The sample shall have been fabricated using the same parts, materials, processes and location proposed for full production. Reports of acceptable first article inspection shall accompany the first part delivered to ATK Space - Belt and shall include all dimensional measurements and results of all electrical, mechanical and non-destructive inspections and tests. The report shall show that the item meets all requirements. The supplier shall notify the Buyer of the date that the first article will be ready for inspection, giving at least 3 working days advance notice. When FAI is imposed, approval of the First Article is required before proceeding with fabrication of the rest of the lot.

14QC-3C Key Characteristics

When ATK Space - Belt or ATK Space - Belts' customer drawing, specification, and/or purchase order includes "Key Characteristics" requirements, the supplier shall employ a Process Variability Reduction/Statistical Process Control (VR/SPC) program compliant with AS9103. VR/SPC related records shall be retained at supplier facility and provided to ATK Space - Belt upon request.

14QC-3D Foreign Object Debris/Damage (FOD)

Where applicable, Supplier shall utilize a Foreign Object Debris/Damage (FOD) prevention program, to preclude introduction of foreign objects into deliverable items. Supplier shall employ appropriate housekeeping practices to assure timely removal of residue/debris generated during manufacturing operations. Areas that have a high probability of introduction of foreign objects should have special emphasis controls in place.

14QC-3E Each part shall be identified with a serial number, traceable to its production inspection lot and test records.



**ATK SPACE SYSTEMS
BELTSVILLE, PASADENA AND LANGLEY SITES
QUALITY ASSURANCE CLAUSES**

- 14QC-3F Each part shall be marked with a manufacturer's date code, traceable to its production lot records. If it is not practical to mark the part, the lowest order of packaging shall be marked with the date code.
- 14QC-3G The supplier is authorized to perform sampling inspection in accordance with ANSI/ASQC Z1.4. Critical characteristics, when defined by drawing, specification or P.O. are to be inspected 100%. Other dimensions and features may be inspected to an AQL of 1.0. The supplier shall supply test/inspection data with actual results.
- 14QC-3H The supplier shall prepare and submit for ATK Space - Belt approval an inspection plan for the test and inspection of articles under this Contract/Purchase Order.

Category 4- Source Inspection, Right Of Access (Government, ATK Space - Belt, ATK Space - Belt Customer)

- 14QC-4A Source Inspection shall be performed by ATK Space - Belt QA representative at the Supplier's plant prior to shipment. The Supplier shall notify the buyer of the date the items will be ready for inspection, giving at least 2 working days advance notification.
- 14QC-4B Government Source Inspection is required. "All work on this order is subject to inspection and test by the Government". The Government Quality Representative who has been delegated the NASA Quality Assurance function on this procurement shall be notified immediately upon receipt of this order. The Government Representative shall also be notified forty-eight (48) hours in advance of the time articles or materials are ready for inspection or test. Shipment may not be made until inspected by or documented authorization to ship is received from, the Government Representative.
- 14QC-4C Work under this purchase order requires government or ATK Space – Belts' customer surveillance/inspection at supplier's plant or sub-tier supplier's facility. The Government or ATK Space – Belts' customer shall also be notified forty-eight (48) hours in advance of the time articles or materials are ready for inspection or test. Shipment may not be made until inspected by or documented authorization to ship is received from, the Government or ATK Space - Belts' customer.
- 14QC-4D The supplier shall provide "Right of Access" to ATK Space - Belt, their customer and regulatory authorities. Access shall include all facilities and quality records involved in this order. The supplier will be notified if the access is required.



**ATK SPACE SYSTEMS
BELTSVILLE, PASADENA AND LANGLEY SITES
QUALITY ASSURANCE CLAUSES**

Category 5- Electrical Parts & Assemblies

- 14QC-5A All Electrical, Electronic or Electromechanical (EEE) parts procured from the Supplier, shall have been manufactured within three (3) years from the delivery date, for Plastic Encapsulated Microcircuits (PEM's) and five (5) years for all others. This shall include all sub-assemblies of the article being procured. Any deviation from this requirement shall be approved in writing by ATK Space - Belt Purchasing, a copy of the authorization shall be included with each shipment.
- 14QC-5B Rigid Printed Board suppliers must meet the requirements of the Master Drawing, IPC 6011 and IPC 6012 and the additional construction, inspection and product assurance requirements of specification NASA/GSFC S312-P-003 "Procurement, Ridged Printed Boards for Space Applications". The supplier is responsible to read all drawing notes and comply with all specifications on the drawings, in the customer files and data, and in the fabrication notes.
- A. Manufacturers certificate of compliance is required that includes date code, lot code, and specifications that apply to the manufacture of the PCB's.
 - B. Required coupons must be supplied with the circuit boards.
 - C. Bare printed circuit boards and their coupons shall be evaluated by GSFC Materials group prior to acceptance.
- 14QC-5C Rigid Printed Board suppliers must meet the requirements of the Master Drawing and must be certified to meet the requirements of IPC 6011 and IPC 6012. The supplier shall comply with all specifications on the drawings, in the customer files and data, and in the fabrication notes.
- A. Manufacturer's certificate of compliance is required that includes date code, lot code, and specifications that apply to the manufacture of the PCB's.
 - B. Required coupons must be supplied with the circuit boards.
 - C. At ATK Space - Belts' option, ATK Space - Belts or a ATK Space - Belts approved supplier may evaluate the bare printed circuit boards and / or coupons prior to acceptance.
- 14QC-5D Each printed wiring board/flex shall be packaged individually in silver saver bags that meet either Mil-B-131H, Type I, Class I or II; Mil-B-81705B, Type I or Mil-D-117E, Type III, Class E, Style 1. A desiccant and humidity indicator shall be placed inside each bag and the bags shall be heat-sealed. There shall be adequate space between the heat seal and the board to allow opening and resealing the bag a minimum of three times. At a minimum, the part number, date code, and panel location designator (or S/N) shall appear on each individual bag.
- 14QC-5E Supplier shall comply with the requirements of the following standards as applicable to this purchase order.
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| NASA-Std-8739.1 | Workmanship Standard for Staking and Conformal Coating of Printing Wiring Boards and Electronic Assemblies |
| NASA-Std-8739.2 | Workmanship Standard for Surface Mount Technology |
| NASA-Std-8739.3 | Soldered Electrical Connections |
| NASA-Std-8739.4 | Crimping, Interconnecting Cables, Harnesses, and Wiring |
| NASA-Std-8739.5 | Fiber Optic Terminations, Cable Assembly & Installation |



**ATK SPACE SYSTEMS
BELTSVILLE, PASADENA AND LANGLEY SITES
QUALITY ASSURANCE CLAUSES**

- 14QC-5F Supplier must certify that the parts provided were manufactured by a source on the NASA GSFC Qualified Parts List (QPL) for the part specification imposed on the procurement.
- 14QC-5G All parts delivered to the requirements of this Purchase Order Line Item shall be from a single manufacturing date code. Mixed lot date codes will not be accepted unless specifically approved in writing by the ATK Space - Belt buyer. The approval for shipment of mixed lots shall be included with the shipping documentation
- 14QC-5H Product from multiple manufacturing lots (e.g. date codes) may be accepted provided the individual lots are separately packaged and identified.

Category 6- Packaging/Shipping Requirements

- 14QC-6A Material supplied against this purchase order shall be manufactured, handled, received, stored, and shipped in a manner to preclude damage from electrostatic discharge (ESD) in accordance with ANSI/ESD- S20.20 or NASA-STD-8739.7. Parts must be properly packaged and identified as required by ANSI/ESD- S20.20. Containers shall be appropriately identified to show electrostatic protection.
- 14QC-6B Packaging shall conform to all requirements specified on drawings, specifications and the purchase order. All material shall be wrapped, bagged, and enclosed in cartons, boxes, or other containers to the extent necessary to provide protection from hazards of contamination and physical damage encountered in general handling, shipping and storage.
- 14QC-6C For items to be drop shipped by the supplier to a government facility, DD-250 acceptance and sign-off is required by a Government Quality Assurance Representative at your facility prior to delivery. The DD-250 will be supplied by ATK Space - Belt.

Category 7- Special Processes

- 14QC-7A For heat treatment of items, (including stress relief, annealing, etc.), provide a copy of the temperature versus time record with hardware shipment. Include definition of chart scale factors and type of furnace atmosphere used, when required.
- 14QC-7B Customer designated sources are required for special processes used on this procurement. When sub-tier suppliers are required, the sub-tier supplier must be approved by ATK Space - Belt prior to subcontracting Special processes. Current information on the designated sources approved for special processes is available through the ATK Space - Belt purchasing representative listed on the your purchase order / subcontract.



**ATK SPACE SYSTEMS
BELTSVILLE, PASADENA AND LANGLEY SITES
QUALITY ASSURANCE CLAUSES**

- 14QC-7C Critical and / or Special Processes - For processes designated as “Critical” or “Special”. A special process certification shall be provided with each shipment. The supplier shall submit documentation showing qualification and/or certification.
- 14QC-7D Special Processes approved by ATK Space - Belt -The supplier shall notify ATK Space - Belt of purposed changes in process definition and, will obtain approval from ATK Space - Belt prior to implementing the change. Changes affecting processes, production equipments, tools and programs shall be documented. Procedures shall be available to control their implementation. Supplier shall flow-down this requirement to their sub-tier suppliers.
- 14QC-7E All “special processes” shall be identified by the supplier and shall require ATK Space - Belt approval prior to use. A special process is defined as one which results in fabricated hardware whose quality, reliability and durability may be compromised by potential variations in the process, and for which subsequent inspections cannot be relied upon for detection of all defects.
- 14QC-7F The supplier shall demonstrate that it is qualified to perform special process(es) in conformance with applicable process specification(s) listed in the PO. Applicable qualification test results shall be forwarded for ATK Space - Belt approval prior to performing the same process on the deliverable product. Furthermore, the process shall be re-qualified if there is a change in material and/or methodology, or if the supplier has not performed the process for more than one year. Process parameters and acceptance criteria shall conform to the applicable process specification(s).

Category 8- Calibration

- 14QC-8A Supplier’s Calibration System shall meet the requirements of ISO 10012 and ANSI/NCSL Z540.1. ATK Space - Belt reserves the right to perform surveys and audits as necessary to assure conformance to ISO 10012 and ANSI Z540.1.
- 14QC-8B Supplier Quality Management System shall be certified to ISO 17025 for calibration (please submit a current copy of the scope of accreditation and accreditation certificate) of items listed in the Purchase Order.
- 14QC-8C Supplier shall provide a test report/calibration certificate for each item calibrated. Each calibration certificate/report shall contain the following as a minimum: description or identification of item; listing of standards used for traceability; date of calibration; procedure used for calibration; test results/values; and, as applicable, certification/report number. When an instrument has been adjusted or repaired, the calibration results before and after adjustment or repair shall be reported.



**ATK SPACE SYSTEMS
BELTSVILLE, PASADENA AND LANGLEY SITES
QUALITY ASSURANCE CLAUSES**

Category 9- Other/Miscellaneous Requirements

- 14QC-9A All shelf life limited items shall have 75% or more of their shelf life remaining at the time of delivery under this purchase order. All shelf life sensitive articles and materials shall be identified with the applicable lot, batch, or date coding numbers, the manufacturing date, date of expiration and storage requirements.
- 14QC-9B Flight or critical support hardware application fasteners
Fasteners will be screened by ATK Space - Belt to the fastener integrity requirements of NASA/GSFC Directive 541-PG-8072.1.2. The supplier shall provide lot traceability and material test reports as defined therein. When identified by ATK Space - Belt as safe life or single point failure items, parts shall be supplied from approved manufacturers listed in 541-PG-8072.1.2, Appendix A.
- 14QC-9C Fasteners used in flight hardware or critical ground support equipment applications shall be procured and screened in accordance with NASA/GSFC directive 541-PG-8072.1.2. The supplier shall provide lot traceability and material test report as defined therein. The supplier shall maintain compliance records and provide ATK Space - Belt C of C documenting compliance with the applicable requirements therein.
- 14QC-9D GIDEP Participation
The supplier shall participate in the GIDEP program in accordance with the requirements of the GIDEP S0300-BT-PRO-010 and S0300-BU-GYD-010. Supplier shall notify ATK Space - Belt Purchasing / Subcontracts, prior to delivery, of any GIDEP notices that affect items to be delivered to ATK Space - Belt, and the disposition which has been taken for the affected hardware.
- 14QC-9E All solvents must be supplied only in a new container that has not been used before to prevent contamination by residual material.
- 14QC-9F Manufacturer's Safety Data Sheet, MSDS, is required with this shipment.
- 14QC-9G When specified the supplier shall provide samples per the purchase order or contract requirements to ATK Space - Belt for review. Written approval from the Buyer is required prior to proceeding with the production run. Samples must be properly identified when shipped to the Buyer and copies of the relevant actual test and inspection results (including radiographs and physical and chemical analyses, where applicable) shall accompany the shipment.
- 14QC-9H Prohibited Materials. Pure tin shall not be used in the construction and surface finish of parts proposed for space hardware. Only alloys containing less than 97% tin are acceptable. The use of cadmium or zinc is prohibited in the construction of space hardware. All cadmium or zinc alloys shall be completely over plated with an approved metal. The supplier's documentation shall include a specific certification that these prohibited materials have not been used.