



Supplier Quality Procurement Requirements		
Document #: QP-7.4.1-003 NMG QMS	Approved By: Andrew J. Clements	Revision Date: 01/30/2024

## Purpose

Defines and explains quality requirements for supplier and supplier's sub-tiers on product purchased by NMG Aerospace.

## Scope

This document is invoked by direct reference on the purchase order.

- No deviation from these requirements is permitted unless specifically authorized in writing by NMG Quality Director or Quality Manager.
- Supplier and processors shall comply with and flow down all applicable requirements to all sub-tier suppliers and/or processors.
- See Appendix A for Collins end user parts and Appendix B when PO specifies LS-SBU-A001-SQM LS Supplier Product Quality Requirements (02)

## Reference

AS13001\_Supplier\_Self\_Release\_Training\_Requirements  
AS5553 Counterfeit Electronic Parts, Avoidance, Detection, Mitigation, and Disposition  
AS6174 Counterfeit Material; Assuring Acquisition of Authentic and Conforming Material  
AS9100 Quality Management Systems  
AS9102 Aerospace First Article Inspection Requirement  
AS9103, Variation Management of Key Characteristics  
AS9117\_Delegated\_Product\_Release\_Verification  
Air Cruisers-QSP-605 Supplier certification program  
Boeing D6-51991 Quality Assurance Standard for Digital Product Definition  
Heroux-Devtek – HPS-010 Quality Assurance Requirements for Suppliers  
Honeywell SPOC  
Safran - SREQ-SLS-001  
Safran – GRP-0087  
NAS 412 Foreign Objective Damage/Foreign Object Debris (FOD) Prevention  
Collins – ASQR-01 Aerospace Supplier Quality Requirements  
Collins – COL-ASQR-PRO-0003 Supplier Quality Common Supplier Requirements  
Collins – LS-SBU-A001-SQM LS Supplier and Product Quality Requirements  
Collins -Quality Procurement Requirements-1.6.1.8  
Collins -Interiors evacuation systems A9000  
Collins -Cargo-MP-1004  
Collins -SIS MSD 601  
Zodiac/Aerazur-IGQ 20022 General quality instructions  
QFRM-7.4.1-006 Quality Procurement Requirements Audit Checklist  
QFRM\_8\_3\_001\_Request\_for\_Deviation\_Waiver  
QWI\_8\_2\_4\_007 Workmanship Standards Acceptance Criteria  
Lilium LP0QS0-0003DIR LP Supplier Quality Management System Handbook

## Responsibility

Supply Chain

- Verify supplier is approved.
- Request serial numbers from Quality as required.



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Quality Assurance

- Issue serial numbers at supply chains request

Supplier Quality Assurance

- Develop and verify supplier in the adherence to this document.
- Provide clarification prior to production.

Supplier:

- ensure the use of customer directed supply and process sources.
- ensure the capabilities of any offload sub tiers to be used and the quality of the products and or services provided.
- shall contact NMG Supplier Quality and or Procurement to obtain any clarifications required prior to production or delivery of products.
- shall contact NMG Procurement if contacted directly by NMG customers to coordinate activities as required.

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**Process**

**Acceptance Authority Media (media used to record the status of tasks/operations)**

The supplier will assure that:

- Processes are accomplished prior to signing the process documentation (“stamp/sign as you go”)
- Processes are performed by those that are qualified/trained.
- Assure that documentation is complete and corrected per industry standards.
- Stamps used to approve product are appropriately controlled to prevent unintended/unapproved usage.
- Staff is trained on the above criteria.

**Acceptance Test Reports**

Acceptance test reports shall be maintained per record retention requirements and provided to NMG Aerospace upon request or as specified below.

- **Special Processor:** Each shipment must include one (1) legible and reproducible copy of a certificate showing each process performed. The certificate(s) shall include the name and current revision level of the process, the specification to which it conforms, the signature and title of an authorized representative of the seller. When parts are serialized, serial numbers must appear on the certification.
- **Certification of x-ray** - All parts requiring radiographic certification will be submitted to a NMG Aerospace and processed in accordance with applicable NMG Aerospace and Government specifications and standards. The x-ray film and one (1) legible and reproducible copy of the report must accompany the material. When parts are serialized, serial numbers must appear on the certification and x-ray film.
- **Raw Material Analysis-** Raw Material orders require chemical and physical analysis for all raw materials used in the manufacturing of this product. Acceptance of raw material(s) utilizing "Typical Analysis Report" will only be accepted if the report specifies the lot, batch, heat, mill, and name of the producer.
- **Synthetic Rubber Components and Raw Material** - Each package of synthetic rubber components shall be marked with date of cure, part number, quantity, compound number, and manufacturer's identification (if different from part number). Date of cure on O-rings shipped to NMG Aerospace shall not be older than is permissible under Bulletin SAE-ARP5316.



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Synthetic rubber raw materials shall be identified with date of cure, compound, and manufacturer's name.

- **Hazardous Material**-Certification and appropriate data sheets defining chemical composition, safety and health hazards, first-aid measures and storage requirements for materials supplied with this order shall be forwarded to the buyer at a minimum of three (3) days prior to delivery and accompany shipment. FAR 52.223-3.

**Certificate of Conformance (C of C) (Ref. appendix below for Collins LS site criteria)**

C of C, signed by the Supplier's authorized representative, shall accompany all materials shipped against this order. As a minimum, the certificate shall include the following:

- The NMG Aerospace Purchase Order number
- Part number
- Revision level
- Quantity
- Serial number, when applicable.
- Shelf Life, when applicable.
- Lot number, when applicable.
- A statement that certifies compliance to the drawing / specification.
- The applicable chemical / physical and/or mechanical test data is on file and available for NMG's customer review.
- Reference any approved DMR's/Waivers/Deviations, etc. for non-conforming product.
- Signature, date, and title of the seller's responsible representative.

**Communication**

All communication regarding any Purchase Order from NMG shall flow through suppliers assigned NMG Supply Chain Representative and/or NMG Quality. At no time "unless formally instructed by NMG in advance" shall any supplier contact NMG's customer regarding any work covered by an NMG Purchase Order. If NMG's customer contacts the supplier regarding any work covered by an NMG Purchase Order, NMG shall be notified immediately. The supplier will notify NMG of any changes in management, ownership, location, MRP system or certification status. The supplier shall notify NMG prior to outsourcing of any product originally produced by the supplier. The supplier will ensure their employees are aware of their contribution to product/service conformity, product safety and the importance of ethical behavior.

**Competence**

Supplier employees will have the required competence and training to consistently provide quality products/services. The supplier will identify required training/competence of employees and assure requirements are met. Inspectors will be trained in metrology and GD&T as required.

**Compliance**

Conflict Minerals: In compliance with US SEC Regulations, the supplier must notify NMG Aerospace if any products it sells contain tin, tantalum, tungsten, gold and their derivatives originating in the Democratic Republic of Congo or surrounding countries.

The supplier will prioritize DPAS rated orders per 15 CFR 700 when specified on the PO. The DPAS rating and DPAS statement on the PO will also be flowed down to their sub-tier suppliers.



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### **Counterfeit Goods**

Counterfeit Goods are defined as goods or components that:

- Are an unauthorized copies or substitute of an Original Equipment Manufacturer (OEM) item.
- Are not traceable to an OEM sufficient to ensure authenticity in OEM design and manufacture.
- Do not contain proper external or internal materials or components required by the OEM or not constructed in accordance with OEM design.
- Have been reworked, remarked, relabeled, repaired, refurbished, or otherwise modified from OEM design but not disclosed as such or are represented as OEM authentic or new.
- Have not passed all OEM required testing, verification, screening, and quality control processes.

NMG Aerospace suppliers/sub-suppliers will take appropriate measures to prevent the delivery of goods containing counterfeit parts/components or materials including:

- For parts/components, procurement from:
  - the OEM
  - OEM authorized supplier (must have OEM cert)
  - customer directed source.
  - supplier that can provide:
    - OEM certs
    - Sufficient records providing unbroken supply chain traceability to the OEM
    - Test and inspection records demonstrating the item’s authenticity.
    - Note: Material certs will be available for all parts/components. Supplier is responsible for verifying chemistry of material certs.
- For raw material, verification to requirements provided on the material certs.
- For Commercial off the Shelf (COTS), verification to requirements on the Certificate of Conformance.

If NMG Aerospace suppliers and/or sub-suppliers become aware of counterfeit goods, Control of Non-Conforming Material Procedure will be followed including potential disclosure to the customer. NMG Aerospace reserves the right to scrap counterfeit parts at the supplier’s expense.

### **Delegated Product Release Verification (DPRV)**

Suppliers are expected to provide products that always meet NMG expectations. Since the supplier’s product can be released directly into NMG Aerospace inventory, the supplier will:

- assure that product provided to NMG is reviewed by a DPRV person.
  - Train DPRV Personnel in accordance with AS13001
  - other than the person that performed the final inspection.
  - with a minimum of 18 months of product knowledge and inspection experience.
  - with a periodic vision assessment.
- The supplier will retain a list of DPRV representatives.
- The DPRV representative shall verify prior to shipment:
  - First article requirements have been satisfied.
  - All required process steps have been completed correctly.
  - Dimensions meet the requirements (verify critical dimensions)
  - Part marking and visual inspection for workmanship have been performed.
  - Process certifications are from a Nadcap/customer approved source and to the approved process/specification.



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- Notify NMG Aerospace of any:
  - loss of third-party certification.
  - process changes that may affect NMG product quality.
  - Changes to the DPRV representative performing the review.
- Refer to the Non-Conforming Product section for potential actions for suppliers that do not meet this requirement.

### **Digital Product Definition (DPD) - D6-51991 Quality Assurance Standard for Digital Product Definition**

When suppliers are not DPD approved in advance by NMG Aerospace, models may be used as reference only (2D prints are the authority data). When suppliers want to use customer supplied DPD datasets as the authority data for manufacturing parts, inspecting parts or producing derivative data, the supplier must be approved by NMG Aerospace in advance. After successful completion of an initial DPD audit, the supplier will perform an internal audit annually on the DPD data and related documentation to assure compliance with contractual requirements, software and production part quality standards, and the observance of security restrictions. Every 3<sup>rd</sup> year NMG will perform an onsite audit.

- The audit plan shall address all requirements of the latest revision of D6-51991 including all CMS equipment and software as noted in section 1.3.1.
- Results of all audits shall be documented and maintained for review and forwarded to NMG Internal Audit Manager/Corporate Quality Manager for review.

### **Distributors**

- Definition- Organization carrying out the purchase, storage, splitting, and sale of products and not transforming, assembling, or otherwise modifying purchased product. Distributors are limited to raw material, industry standard, and Commercial-Off-The-Shelf (COTS) parts.
- Definition of Commercial off the Shelf (COTS)-Commercially available items or products, defined by industry recognized specifications and standards, sold through public catalog listings.
- All Distributors in the supply chain shall be certified by an industry accredited body to AS/EN/JISQ 9100, AS/EN/JISQ 9120, ISO 9001, or IATF16949:2016

### **Ethics**

- **Health and Safety** – The supplier will provide the facilities, equipment, tools, procedures, safety programs, and training necessary for employees to work injury and illness free and comply with all applicable government laws and regulations.
- **Regulatory Compliance** – The supplier will comply with applicable laws, regulations, and legal requirements including trade controls, employment, environment, competition, etc.
- **Financial Integrity** – The supplier will assure that funds are appropriately spent, financial reports are complete, accurate, and timely, and internal accounting controls are followed.
- **Respect in the Workplace** – The supplier shall assure the right of all employees to work in a respectful environment free of harassment, unlawful discrimination, intimidation, bias, or violence of any kind.
- **Gifts, Donations, and Bribery** – The supplier will not perform any actions that can be perceived as bribery. Gifts, meals, entertainment, and other business courtesies will be limited.



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- **Confidential information** – The supplier shall assure that confidential information is protected and shared with others under a disclosure agreement.

**First Article Inspection**

First article inspection (FAI) shall be completed and maintained by the supplier per current revision of AS 9102 (see appendix C for Collins Landing Systems requirements). The supplier will notify NMG Aerospace when any changes are made that require an FAI. The supplier shall perform a full FAI or partial (Delta) for affected characteristics, when any of the following occur:

- First production runs for the NMG part (Full FAI required).
- A change in design characteristics affecting form, fit or function.
- A change in manufacturing source(s), process(es), inspection method(s), location of manufacture, tooling, or materials that can potentially affect form, fit or function. (i.e. – location of manufacture change, NMG specified sub-tier supplier change). (Delta FAI may be acceptable).
- A change in numerical control program or translation to another media that can potentially affect form, fit or function.
- A natural or man-made event, which may adversely affect the manufacture process.
- An implementation of corrective action required to complete previous FAI, as described in AS9102, section 4.4.
- A lapse in production for two years shall require an update for any characteristics that may be impacted by the inactivity. This lapse is from the completion of last production operation to the actual restart of production.

**Note: NADCAP Special Processors shall be identified on Form 2 with special process and NADCAP/PRI certification number.**

**Foreign Object Debris/Damage**

Contact NMG Aerospace if product damage or obvious non-conformances are identified upon receipt. If instructed to process, document non-conformance on the C of C. Supplier will maintain a FOD program that is compliant with NAS 412 Foreign Object Damage / Foreign Object Debris (FOD) Prevention. Process will be implemented to prevent parts from touching each other or other hard surfaces. Preventive Maintenance will be performed as planned on material handling equipment to assure continued product protection.

**Identification and Traceability Product:**

- Non-serialized parts must be identified with a lot/serial number and date of manufacture. The traceability number must be on the shipping paperwork and traceable back to supplier’s production and product conformity.
- The supplier shall retain evidence to document that items furnished under this contract conform to contract requirements. Evidence will generally include information tracing the items back to the manufacturing source or its authorized distributor. At a minimum, evidence shall be sufficient to establish the identity of the item, its manufacturing source, and conformance to the item description. Documentation will be kept indefinitely.
- Identification must be legible after all finishes with unaided eye.



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**Inspection**

- Sampling permissible to ASQ H1331 Zero Acceptance Number Sampling Plans initial minimum requirements C=0, AQL 1.0.
- 100% inspection is required for all identified key characteristics until verification of acceptable Gauge Repeatability and Reproducibility and  $\geq 1.33$  CPK capability is obtained.
- When/If a CPK of  $\geq 1.33$  cannot be obtained, the supplier will continue with 100% inspection and create an improvement plan per AS9103.

Refer to the NMG Aerospace internet Supplier Portal for QWI\_8\_2\_4\_007 Workmanship Standards Acceptance Criteria.

**Material Review Board (MRB) / Nonconforming Material Disposition Authority:**

- The supplier may disposition any product where they are the design authority except the top-level part where NMG or NMG’s customer requires approval.
- Supplier may disposition nonconforming material as “scrap” for supplier owned materials without NMG Aerospace approval.
- Supplier may disposition nonconforming material “rework to print” within normal process controls prior to outside processing without NMG Aerospace approval unless product is governed by Customer specifications.
- Any nonconformance to a build to print design that cannot be eliminated and brought back into conformance to NMG Aerospace/customer design shall be presented to NMG Aerospace for approval (i.e. “use as is” or “repair”) prior to shipment.
- Suppliers cannot deviate from P.O. without NMG approval. A Request for Deviation/Waiver (QFRM 8.3-001) must be submitted to NMG Engineering and NMG SQA via the NMG Buyer within 24 hours of first awareness of a nonconforming condition.

**Non-conforming Product**

- Scrap dispositions apply only to supplier supplied material. When replacement of product is necessary to fulfill the deliverable quantity on lot-controlled items, such replacements shall be from the same material lot, batch or heat lot, as applicable. In the event that the scrap disposition renders the deliverable quantity short, notify NMG Aerospace buyer immediately.
- The supplier shall notify NMG Aerospace promptly (within 24 hours) of discovery of any nonconformity affecting product already delivered. Notification shall include a clear description of the discrepancy; parts affected (Serial Number, lot number or manufacturing date, as applicable), quantity, and delivery date(s). Supplier shall support NMG Aerospace with additional data, and parts if necessary, per contract, to resolve customer concerns. The Supplier will provide a timely and effective corrective action to prevent non-conformances.
- Suppliers with the poorest DPPM and escape performance or those with repeat escapes will be evaluated for potential third party Source Inspection at the supplier’s expense. If enforced, 3rd party source inspection will be added to the Supplier Improvement Plan. The 3rd party source inspector will sign the supplier’s C of C as evidence of the source inspection and will provide NMG source inspection results as planned. Third party source inspection can be removed after three consecutive acceptable receipts or other NMG defined criteria. Source inspection does not relieve the supplier of any responsibility and/or liability for full compliance with all contract requirements.





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### **Part Packaging and Preservation**

Parts must be packaged, stored, and shipped in a manner to prevent damage and preserves product conformity.

Reference ASTM-D3951-10 for “Standard Practice for Commercial Packaging”

Reference MIL-STD-2073-(current revision) for “Standard Practice for Military Packaging

Reference LGPS 1000 Corrosion Control

### **Process Best Recommended Practice**

- Look-alike parts should **not** be stored in adjacent locations, or kitted together in the same container, unless mistake proofing strategies are implemented. These strategies might include unique packaging, coloring, marking, or machine reading of part numbers.
- Create inspection control plans & methods to ensure that all hidden features are verified while accessible.
- Interface: When possible/required, interface and alignment features shall be verified by physically engaging the feature with a fixture identically mimicking the mating surface or representing the maximum and minimum tolerance conditions of the mating feature characteristics.
  - If physically engaging a feature will compromise its function (e.g. locking threads), then an alternate method to verify proper dimension and physical location shall be documented on the process control plan.
  - Visual alignment features (e.g., scribe lines and connector labeling) should be 100% visually inspected. Poke-Yoke inspection fixtures should be used wherever possible for these inspections.
- 100% of un-mated electrical connectors should be inspected at final inspection for bent pins, pushed pins, and FOD.
- O-rings
  - When AMS2817 is specified, O-rings are to be individually packaged and labeled.
  - O-rings should be lubricated prior to installation. Only appropriate lubricates shall be used unless otherwise specified or approved.
  - Plastic or protected metal caps should be used to protect O-rings or other seals from damage during handling or installation. Protected metal caps must always be kept in protective enclosure to prevent raised burrs due to damage.
  - Slide or push O-rings or other seals into place (i.e. do not roll into place).
  - When mating parts with O-rings or other seals, positive alignment tooling shall be used to prevent blind cutting of seal due to misalignment.
- Part Marking
  - Part marking inspection and verification procedures should include a photo or other replica of required content, format, marking method, and location per contract specifications.
  - All barcodes should be verified with software capable of creating validation and verification. Reports of this verification should be included in shipping paperwork.
  - If Part Marking process is not fully automated (e.g. vibra-peening, ink marking, manual data entry is required), then second person verification of the output should be implemented in addition to final inspection.
- Product Handling
  - Eliminate material-to-material contact that could damage the part / product.



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- All product handling equipment should be on a Total Productive Maintenance (TPM) schedule to validate that the product protections are still in place, free of contaminants, and have not diminished or been damaged over time.
- Torque: A validation of torque tool settings and output should be performed and recorded against acceptance criteria, using a torque tester, per the following:
  - For manual torque tools validation should be performed a minimum once per shift using a stationary tester and defined validation range requirements for each torque tool.
  - After final torquing, all fasteners should be re-checked with a torque tool set between the original set point or lower (within the specification range), or to the set point less prevailing torque.
  - When selecting a torque tool, the following requirements should be adhered to: -The increment between two graduation marks of a scale should be in compliance with ISO 6789 - The increment between two graduation marks of a scale should not exceed 10% of the total torque tolerance on the drawing. - The torque setting of the tool should be within a set range in compliance with ISO 6789.
  - If used, torque tool extenders should be defined on the work instructions with tool identification numbers and specific use configuration. The torque range values should be defined on the work instructions, including the impact of the angle of the extender with respect to the handle during the application of the torque. Torque tool extenders will change the effective torque and should be validated in the as-used configuration.
- Key Process Characteristics: The supplier should identify and control (including gage R&R and capability studies) key process characteristics whose control is essential to manage variation. The following key characteristics are recommended at a minimum:
  - Individual feature tolerance; any machine feature with a total tolerance of less than 0.001”.
  - Surface finish on Sealing surfaces equal to or less than 16 micro inches (i.e. ports).
  - Location or positional tolerance less than or equal to 0.002”.
  - Feature control tolerances less than 0.002” (i.e., cylindricity, TIR, parallelism).
  - Any dimension or feature determined by the Engineer to be a critical to the performance of the product or the process.

### **Obsolescence**

The supplier will notify NMG Aerospace immediately of plans by the supplier or their sub-tier to obsolete materials/parts purchased by NMG Aerospace.

### **Quality System**

The supplier’s quality system will be ISO 9001 (AS9100 preferred) certified unless agreed approved in advance from NMG Aerospace. See Special Process for processors. The supplier is to notify NMG Aerospace within 3 days of any loss or suspension of certifications.

### **Record Retention**

- Must be controlled indefinitely.
- Suppliers must have process for record storage, retention, and retrieval.
- Supplier shall not destroy the records without first providing NMG the opportunity to retain the records and obtaining NMG written permission for destruction.
- Cloud servers used to store records need to be ITAR compliant.



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- Changes to records provided by the supplier have been revised correctly (single line, initials and date, correct entry).

### **Right of Access**

The supplier and processor shall provide access for NMG personnel, government and civil aviation authorities, and customers to their facilities, personnel and records when requested as required for quality and management systems reviews, product / process validation evaluations, or investigations. The supplier and processor shall flow down this requirement to all of their sub-tier suppliers.

### **Shelf Life**

Materials or articles having definite age degradation characteristics (shelf life) shall be identified with manufacturing date, and/or cure date, shelf life, expiration date, storage condition requirements and any other data pertinent to the supplied materials or articles.

- NMG reserves the right to reject and/or return any material with less than 80% of shelf life remaining.

### **Special Process**

Special Process certification for build-to-print parts: The below special processes shall require Nadcap accreditation. All suppliers of build-to-print parts performing these special processes (regardless of tier) shall be Nadcap accredited for each special process, unless granted a waiver or exemption by the design authority:

- Chemical Processing
  - Plating/Electro-Deposition
  - Electroless Plating
  - Anodizing
  - Wet paint Application
  - Passivation
  - Chemical Conversion Coatings
  - Dry Film Lubrication
- Coatings-effective
  - Thermal or Plasma Spray
  - Vapor Deposition of metals
- Heat Treating
  - Heat Treating
  - Annealing
  - Furnace, Vacuum, and Dip Brazing
  - Hot Isostatic Pressing (HIP)
- Materials Testing Laboratories (Accreditation by either Nadcap or by signatories to the ILAC e.g., ISO 17025 is required for materials testing laboratories) 12/7/23
  - Material Testing
  - Chemical Testing
- Non-conventional Machining and Surface Enhancement and when Special Process Provisions are indicated by Drawing or Specification
  - Electrical Discharge Machining (EDM)
  - Laser Beam Machining (LBM)
  - Shot Peening



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- Non-destructive Testing
  - Radiographic Testing
  - Penetrant Inspection
  - Magnetic Particle Inspection
  - Ultrasonic testing
  - Eddy Current Testing
- Welding
  - Fusion Welding
  - Torch and Induction Brazing

Note: Special process categories are defined by Performance Review Institute (PRI). Nadcap or International Laboratory Accreditation Cooperation (ILAC). Special processes within the above categories (e.g., Chemical Processing) but not listed above are out of scope and Nadcap is not required.

**Note:**

Design Responsible Supplier shall have a comprehensive special process management program in place for the special processes listed above.

The program shall include maintaining a list of qualified Special Process Suppliers along with their Nadcap approval status.

If Special Process Suppliers do not hold Nadcap certification, Design Responsible Supplier shall maintain appropriate oversight of internal and supplier processes including, but not limited to, onsite special process audits, periodic testing of product, and other means to validate product integrity.

**Superseding Requirements**

Special Processes supplied shall be produced in accordance with PO, applicable drawing, and specifications. Any deviation (including the use of superseding specifications) must be authorized and approved by the Design Authority.

**Work Transfer**

Supplier shall have a documented work transfer process per IAQG SCM and ensure its application in its entire supply chain. NMG can provide guidance and assistance to establish a program.

**ZDP Supplier Development Plan**

Suppliers will be notified if the development of a ZDP plan is required.

NMG Supplier Quality Engineer (SQE) will assist in developing a Zero-Defect Plan (ZDP) to:

- Improve Supplier Skills.
- Improve Supplier Parts.
- Improve Supplier Processes.

**Quality Records: Ref. QFRM-4.1-002 Record Retention**

**Revision: See archives for previous revisions**

Revision Date	Change Description	Major/Minor
07/05/2023	LS-SBU-A001-SQM now incorporates the former LS-SBU-A002 FAI requirements and LS-SBU-A004 MPS docs	Minor



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8/29/2023	Definition of distributors	Minor
12/04/2023	Special Processing Clarifications	Minor
01/30/2024	Definition of Commercial off the Shelf (COTS) listings	Minor

**UPDATE INTERNET**

## Appendix A – COLLINS Additional End User Requirements

### Inspection Requirements

100% inspection of all features is required. After successful FAI and 25 consecutive pieces are produced with all features found to be acceptable, reduced inspection using C=0, .65 AQL or 2.5 AQL (based on ASQR-20.1 Table B) may be considered.

## Appendix B – COLLINS Landing Systems Additional End User Requirements

### General

1. The following quality requirements documents, latest versions, apply:
  - 1.1.1. LS-SBU-A001-SQM, UTC Aerospace Systems LS Supplier and Product Quality Requirements (<https://utcaerospacesystems.com/wp-content/uploads/2020/03/LS-SBU-A001-SQM-05-Supplier-and-Product-Quality-Requirements-docx.pdf>)
  - 1.2. COL-ASQR-PRO-0003, Supplier Quality Requirements (<https://utcaerospacesystems.com/wp-content/uploads/2019/10/COL-ASQR-PRO-0003-01.pdf>)
  - 1.3. ASQR-01, UTC Aerospace Supplier Quality Requirements (<https://www.rtx.com/suppliers/united-technologies-suppliers/united-technologies-asqrd>)
  - 1.4. LS-SBU-A001-SQM - First Article Inspections Supplier Instructions
  - 1.5. LS-SBU-A001-SQM - Manufacturing Plan Review and Approval
2. All special processing (heat treat, NDT, plating, etc.) must be performed by sources listed in Document 200 LS Approved Processor List, unless otherwise specified (<https://utcaerospacesystems.com/wp-content/uploads/2020/06/Doc-200-R-2020-06-29.pdf>).
3. Any subcontract machining requires prior NMG approval. Notify the NMG buyer.
4. Machining techniques which impact significant localized heating (i.e. EDM, EMC, Plasma application, and laser use) may not be used unless specifically allowed by the control drawing.

### First Article

LS-SBU-A001-SQM - First Article Inspections Supplier Instructions

1. LS Approved FAIR packages shall contain the following as applicable and be sorted as follows:
  - b) Purchase order Part number FAI forms 1,2,3



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- c) Copy of the customer purchase order
  - d) Copy of the Document Information Record (DIR) with Children
  - e) Non-conformance reports (QNs), if applicable
  - f) Sub-components and Assemblies Form 1(s), COTS certifications
  - g) Ballooned drawings and Captures
  - h) For source-controlled parts, the LS approved supplier drawing/captures (ballooned)
  - i) A readable copy of all applicable Material Certifications
  - j) A readable copy of all Processing certifications
  - k) Processing approval evidences (Doc 200, D1-4426)
  - l) Manufacturing approval memos
  - m) ATP/FTP
  - n) Photos of Part Identification
  - o) Photos of the overall part (orthographic or views taken in the same perspective as DPD captures are preferred).
5. Reference additional requirements for AS9102 FORM 1, field 18 noted in COL-ASQR-PRO-0003. This information is required when the INDEX section (Fields 15 -18) is applicable to the product supplied.
6. Reference additional requirements for AS9102 FORM 1, field 11 and field 12 noted in ASQR-01. The information is required. The “Supplier Code” is the NMG assigned supplier number noted on the NMG PO to the supplier. The Purchase Order Number is the NMG PO number noted on the PO to the supplier.
7. Reference additional requirements for AS9102 FORM 3, field 14 noted in ASQR-01. The requirements noted are applicable to each characteristic.

### **Manufacturing Plans and Techniques**

- LS-SBU-A001-SQM LS Supplier and Product Quality Requirements
  - LS-SBU-A001-SQM - Manufacturing Plan Review and Approval
- Manufacturing plans (MPS) must be generated for all individual components and assemblies when the supplier is manufacturing to an engineering drawing / model and does not have design authority. Manufacturing plans (MPS) must be submitted and approved by NMG prior to start of manufacturing unless approval from NMG procurement in writing to proceed at supplier risk. The planning must include the minimum engineering data references (specification, flag note, etc.) necessary to control and produce the parts and include all of the machining, processing, test and inspection operations necessary to complete the parts to the purchase order and engineering requirements. This includes applicable satellite plans and techniques from sub tier suppliers and processors. All plans must be reviewed and approved by the supplier prior to submit to NMG. The manufacturing plan(s) must be retained on file at the supplier’s manufacturing facility or their sub-tier when applicable and must be available upon request by NMG. The plan documentation must include the following details as a minimum:
- Name and address of the raw material, supplier, and outside processing.
  - Full part number including dash number.
  - Engineering drawing / model revision level.
  - MPS revision and date
  - Planning revision table including revision dates, descriptions of changes and traceability to the individual making the change. All planning changes must be documented, including editorial changes to correct typographical errors or minor editorial changes.



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- Raw material, raw material specification, raw material size and heat treat condition.
- All operations must be noted in their proper manufacturing sequence including all inspection and test points.
- Part identification including process specification, method, process detail (i.e. depth, font size) and text.
- If parts require serialization, contact NMG buyer for a range of serial numbers to use, if not already included on the purchase order. **NOTE** – the SN prefix is **NMC** unless otherwise specified on the PO.
- Supplier acceptance stamp is required on all finished parts, bag or tag. Date of manufacture, batch or lot number is required for all non-serialized products. This must be noted on all MPS at the appropriate operation prior to release and shipment to NMG.
- Special process operations must list the name and location of the processor, applicable specifications, and specific parameters (i.e.: type, class, as applicable).
- Special processes must be controlled, and special process sources must be approved, listed on NMG or customer APL - Document 200 (<https://utcaerospacesystems.com/wp-content/uploads/2020/06/Doc-200-R-2020-06-29.pdf>).
- All thermal processing must be listed as a separate operation (i.e., embrittlement relief, stress relief, etc.). Required times, conditional delay requirements and temperatures must be documented.
- Machining techniques which impart significant localized heating (i.e. EDM, ECM, plasma application, and laser use) are not to be used unless authorized by engineering requirements, or MRB disposition.
- All MPS must include special process techniques that are traceable to their specific technique number, revision and or date. Reference LS-SBU-A001-SQM & LS-SBU-A004-SQA (obtain from the buyer) for additional requirements.
- All NDT techniques must be approved by a recognized NDT Level III authority.
- All manufacturing plans and techniques shall be reviewed by the supplier at least every five years to ensure compliance to current engineering and specification requirements.

Note – For products with a minimum tensile strength 180 KSI (HRC 40) and above, no changes are permitted to the MPS once approved except as noted below. Changes must be submitted and approved prior to implementation.

Allowed changes: The following are allowed changes to an approved manufacturing plan and do not require NMG or Collins LS M&PT and QA approval (changes will be documented within MPS revision table):

- Editorial changes
- Clarification of existing instructions
- Documentation of changes to drawing revision level for parts
- Typographical errors
- Unplanned rework which meets all of the following:
  - Rework not in violation of any specific provisions of the manufacturing plan, and
  - Is in accordance with the applicable process specification, and
  - Which does not result in any change to sequence of special processes, and
  - Which does not adversely affect the final product quality and integrity



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- Rerouting (offloading, sub-contracting) activity that does not involve the following:
  - Heat treatment/Stress relieving
  - Shot or glass bead peening.
  - NDI, including magnetic particle inspection, ultrasonic inspection, and x ray inspection.
  - Proof load testing
  - Plating processes
  - Thermal spray coatings
  - Welding
  - Grinding chromium plating
  - Grinding and superfinishing HVOF coatings





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## Certificate of Conformance (C of C)

**Table 2 – CoC Information**

Information	When Required	Description
Date of CoC	Always	Date CoC completed
Supplier name and address	Always	Name, address, (manufacturing or service provider releasing the CoC)
Deliver To	Always	Name and address of location to which product is to be delivered
Purchase Order (PO) Number	Always	Customer purchase order number
PO Line-Item Number	Always	PO Line-Item Number
Quantity	Always	Quantity of delivered products or services
Part Number	Always	Part number (including applicable dash number) as listed on PO
Part Name	Always	Part name as listed on PO
Engineering Revision	Always	Full drawing revision including all applicable engineering documents (including ATP / ATR Revisions)
Country of Origin	Always	Country location of manufacture
CoC Approval	Always	<ul style="list-style-type: none"> <li>Signature or Unique Identifier (electronically printed or manually and legibly written (e.g., signature, stamp, etc) of the person releasing the product or service.</li> <li>Electronic signature is acceptable if traceable to approver.</li> </ul>
CoC Approval Date	Always	Date CoC Approval signature applied
Forging or Casting Approval Memo Number	As applicable	Approval Memo Number
DIR Revision (*LG)	As applicable	DIR Revision
Date of Manufacture (DoM)	As applicable	For items with limited shelf life; Date of Manufacture or Cure Date for elastomeric products
Traceability	As applicable	Serial number(s) of parts delivered.
QN / MRB Number	As applicable	<ul style="list-style-type: none"> <li>List of all QN Numbers associated with this shipment.</li> <li>If QN number is listed, objective evidence must be provided of completed QN with shipment.</li> <li>When a part is shipped with an open QN, Request for Custody (RFC) Form shall be used (Contact Your LS Procurement Representative)</li> </ul>
Sub-Component Part Number, Revisions, S/Ns	As applicable	Listing of all applicable Part Numbers, Revisions, Serial Numbers (if required) denoted from the Parts List or Bill of Material for the item denoted on the applicable Purchase Order at minimum.
FAA - PMA Statement	As applicable	Enter applicable information