SUPPLIER QUALITY REQUIREMENTS

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1.0 PURPOSE/SCOPE

The requirements herein are supplementary to AS/EN/JISQ9100, AS/EN/JISQ9120 and ASQR-01 Aerospace Supplier Quality System Requirements. These requirements are applicable to Collins Aerospace suppliers who furnish product, material, processes, and services, as cited by the Collins Aerospace Purchase Order. Collins Aerospace SBU/sites reserve the right to apply additional requirements as applicable.

2.0 RESPONSIBILITY

2.1 When this document is referenced on the Collins Aerospace or their affiliates' purchase orders or other contractual documents, suppliers are responsible for compliance to all applicable requirements herein (reference Appendix 2).

2.2 It is the responsibility of the supplier to ensure that all applicable Raytheon Technologies (RTX) and Collins Aerospace contract requirements are flowed down through the supply chain. Requirements within this document which are not directly applicable to Distributors, but still applicable to the product being supplied (refer to Appendix 2), the Distributor is responsible to flow these requirements down to their suppliers and ensure oversight and compliance.

3.0 REFERENCES

AMS2817 – Packaging and Identification of Molded Elastomeric Seals and Sealing Components

AS5553 – Counterfeit Electrical, Electronic, and Electromechanical (EEE) Parts; Avoidance, Detection, Mitigation, and Disposition

AS6174 – Counterfeit Material; Assuring Acquisition of Authentic and Conforming Material

AS6496 – Fraudulent/Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition – Authorized/Franchised Distribution

AS9100 – Aerospace Standard Quality Management Systems

AS9102 – Aerospace Frist Article Inspection Requirement

AS13003 – Measurement Systems Analysis

ASTM D3951 – Standard Practice for Commercial Packaging

ASQR-01 – Supplier Quality System Requirements

ASQR-20.1 – Supplier Sampling Requirements

ASQR-01 Form 2 – Change Notification

ASQR-01 Form 3 – Supplier Communication

ASQR-01 Form 4 – Work Transitions

COL-FRM-0087 – Quality Control Action Requirements

DFARS 252.246-7007 – Contractor Counterfeit Electronic Part Detection and Avoidance System

DFARS 252.246-7008 - Sources of Electronic Parts

EASA Form 1 Tags – EASA Part 21, Appendix 1, EASA Form 1 Authorized Release Certificate

FAA Form 8130-3 Tags – FAA Order 8130.21 – procedure for completion of use of the Authorized Release Certificate, FAA Form 8130-3, Airworthiness Approval Tag

ISO 6789 – Assembly Tools for Screws and Nuts – Hand Torque Tools – Requirements for Calibration and Determination of Measurement Uncertainty

For RTX documents visit: https://www.rtx.com/suppliers/united-technologies-suppliers/united-technologies-asqrd. For Collins Aerospace documents visit: https://utcaerospacesystems.com/supplier-documents/.

4.0 Acronyms and Abbreviations

AAM	– Acceptance Authority Media
AOI	– Automated Optical Inspection
BOM	– Bill of Material
C of A	– Certification of Assurance
C of C	– Certification of Conformance / Certification of Compliance
CAAC	– Civil Aviation Administration of China
COTS	– Commercial off the Shelf
DFARS	– Defense Federal Acquisition Regulation Supplement
DQR	– Designated Quality Representative
EASA	– European Union Aviation Safety Agency
FAA	– Federal Aviation Administration
FAI	– First Article Inspection
FOD	– Foreign Object Damage
GIDEP	– Government-Industry Data Exchange Program
HAZCOM	– Hazard Communication
MPR	– Manufacturing Process Review
MRB	– Material Review Board
MSDS	– Material Safety Data Sheet
NDT	– Non-Destructive Testing
OEM	– Original Equipment Manufacturer
QMS	– Quality Management System
QN	– Quality Notification
SBU	– Strategic Business Unit
SDS	– Safety Data Sheets
SP	– Special Process
sFAI	– Statistical First Article Inspection
ZDP™	– Zero Defect Plan™

5.0 REQUIREMENTS

5.1 GENERAL REQUIREMENTS

5.1.1 Suppliers and their supply chain shall follow all applicable requirements (see Appendix 2) within this document unless documented authorization is obtained and approved by the Collins Aerospace SBU/site Supplier Quality Director.

5.1.2 When sourcing a Collins Aerospace designed part through distribution and the source is not designated on the drawing, the distributor shall ensure the product is procured from a current Collins Aerospace approved source.

5.1.3 The Qualified Distributors List (QDL) shall be utilized when procuring metals, electronics, and hardware from a distributor. These qualified distributors can be found on the QDL located at https://www.rtx.com/suppliers/united-technologies-suppliers/united-technologies-asqrd. When there is an authorized supply/distribution chain, they shall be used.

5.2 ORDER OF PRECEDENCE

5.2.1 In the event there is a requirement that appears to conflict with any other requirement, the supplier shall contact Collins Aerospace for clarification using ASQR-01 Form 3.

The order of precedence for documents is as follows:

1) Contract (i.e., Purchase Order, Long Term Agreement)

2) Drawing Referenced on PO

3) Collins Aerospace Referenced Specifications on Drawing

4) Industry Specifications Referenced on Drawing

5.3 RECORD RETENTION

5.3.1 Record retention shall be per any applicable regulatory requirements (e.g., FAA TSO, CAAC, and EASA).

5.3.2 Minimum retention periods for all retained documented information, needed to provide evidence of conformance, by part types are specified in ASQR-01 Table 3 for all Collins Aerospace SBU/sites.

5.3.3 If the supplier is unable to maintain the quality records, the supplier shall provide the option for Collins Aerospace SBU/site to take possession of the records.

5.3.4 Quality records shall not be destroyed without written approval from Collins Aerospace.

5.3.5 Quality records approved for destruction shall be rendered unreadable.

5.4 ACCEPTANCE AUTHORITY MEDIA (AAM)

5.4.1 The supplier shall, within its organization and its supply chain, ensure that the use of Acceptance Authority Media (AAM) (e.g., Stamps, electronic signatures, passwords) is clearly defined within its Quality Management System (QMS). Supplier shall ensure the method of AAM is controlled and secure. The use of AAM is considered personal commitment of accuracy of work performed or witnessed. If an employee is terminated or leaves the Supplier's employment, their AAM access is removed.

Suppliers shall maintain compliance to the AAM requirements by assessing processes and supply chain as part of their internal audit activities. The areas of focus of this assessment shall include but not limited to:

- AAM application errors (e.g., omission, typos, legibility)
- AAM application untimely use (e.g., documentation is not completed as planned, "stamp/sign as you go")
- AAM application misrepresentation (e.g., uncertified personnel, falsification of documentation, work not performed as planned)
- AAM application training deficiencies (e.g., ethics, culture awareness, proper use of authority media)

5.5 QUALITY ALERTS/GIDEP ALERTS

5.5.1 Quality Alerts are used to communicate pertinent quality related issues or other approved information to suppliers and/or processors. Actions defined within an Alert are in alignment with the applicable Collins Aerospace SBU/site flow down requirements and will typically include an implementation date. Suppliers shall perform the following upon receipt of alerts:

- Review the actions listed in the alert
- Determine contractual impact (if any) to the alert
- Notify the applicable buyer of any potential impact.
- Take necessary actions to ensure compliance to requirements
- Respond as outlined in the alert

5.5.2 Per Collins Aerospace SBU/site flow down requirements, Suppliers in the United States and Canada that directly or indirectly do business with the government or supports the government's acquisitions of systems, facilities and material shall participate in Government/Industry Data Exchange Program ("GIDEP"). Suppliers delivering directly or indirectly to Collins Aerospace SBU/site shall action GIDEP

alerts covering the product per the requirements within the Alert correspondence, and Collins Aerospace SBU/site shall be informed of status whether they come through a Collins Aerospace SBU/site or through a supplier's supply chain. Collins Aerospace supply chain members shall be a GIDEP member and ensure alerts are actively monitored, issued, and addressed. Refer to www.gidep.org for more information on participation and operations.

5.6 COUNTERFEIT RISK MITIGATION

5.6.1 Suppliers and distributors are required to implement and enforce a written Counterfeit Parts Prevention and Control Plan per industry standards. The plan shall flow down requirements of AS6496, AS5553, AS6174, DFARS 252.246-7007, and/or DFARS 252.246-7008 as applicable throughout the supply chain.

5.6.2 Purchases from independent distributors (i.e., brokers) are not allowed without prior documented approval from the SBU/site.

5.7 CONTROL OF NONCONFORMING PRODUCT

5.7.1 Suppliers without MRB authority formally approved by Collins Aerospace SBU/site shall follow the SBU/site requirements of dispositions and control. Suppliers are not authorized to disposition non-conforming product for Collins Aerospace design characteristics. (including supplier Use-As-Is dispositions).

5.7.2 Collins Aerospace acknowledges suppliers with MRB authority via Collins Aerospace SBU/site letter of delegation, if applicable. The terms and conditions listed in the letter of delegation shall be accepted in writing by the supplier, is subject to audits, and may be withdrawn at any time.

5.8 SUPPLIER INITIATED CHANGES

5.8.1 Changes that affect quality and/or product fit, form, or function (process improvements, changes to special processing mentioned in table 3, changes to measurement methodology, changes to resources/equipment, etc.) using ASQR-01 Form 2 shall be approved by Collins Aerospace SBU/site. Suppliers shall have a documented process to manage change for product and processes. The change management process, at a minimum, shall include the following elements:

a) Change documentation, including configuration control of manufacturing work instructions

b) Evaluation of risk
c) Risk mitigation action plans
d) Product validation plans
e) Collins Aerospace notification via ASQR-01 Form 2
f) Submit method of validation along with ASQR-01 Form 2
g) FAI provided

5.8.2 For supplier planned work transfers, the supplier shall request approval from each impacted Collins Aerospace SBU/site using ASQR-01 Form 4; the movement of work shall not commence until approval from the affected Collins Aerospace SBU/site is received. Collins Aerospace may notify the supplier of the required Engineering Test and Quality Plan actions that are required to ensure the integrity of the product throughout the life cycle of the project and is maintained after the project is complete.

- Notification is not required if changing from one source performing a specific special process to another Collins Aerospace approved special process supplier approved for the same process.

- Suppliers shall validate all offloaded features, characteristics, and compliance to Collins Aerospace requirements. Offload of work and multi-sourcing are also work transfers and all requirements shall be met.

5.9 OBSOLESCENCE

5.9.1 Suppliers shall provide evidence of an obsolescence management process that includes risk assessment as well as definition of affected or potential parts and assemblies. Suppliers shall provide evidence of compliance per planned internal and external assessments with the supply base.

5.9.2 Notification of any potential, known or planned obsolescence, or if planning to procure obsolescent product shall be submitted on ASQR-01 Form 2 to the affected Collins Aerospace SBU/site buyer with sufficient lead time so as not to disrupt schedules.

5.10 SUPPLIER DESIGNED PARTS

5.10.1 All changes to supplier designed material that may affect Collins Aerospace flow down requirements shall be approved by each impacted Collins Aerospace SBU/site prior to incorporation, or as modified by prior contractual requirements.

5.10.2 Approval verifies Collins Aerospace agreement with design and testing concepts for the intended application. Approval does not relieve the supplier of responsibility to meet form/ fit/ function requirements.

5.11 SUPPLY OF KITTED PARTS

5.11.1 Where kits of parts are supplied, the supplier shall establish a documented process within the QMS for the management and control of kit configurations, covering the following requirements:

- Kit to be configured within the Suppliers Bill of Materials system or equivalent.
- Route cards/ picking list established for each Kit
- Verification of issue status for each part in the Kit
- Provision and control of identification and traceability within the Kit
- Provision of adequately trained personnel
- Items subjected to concession/ production permit action shall be identified with the Collins Aerospace concession number prior to delivery.
- A certificate of conformance shall be submitted upon the completion of Kitted Parts.

5.12 CUSTOMER SUPPLIED OR OWNED TOOLING, GAGES AND FIXTURES

5.12.1 Suppliers shall maintain an accountable property list to monitor activity and location of Collins Aerospace or government owned tooling/gages/fixtures in their custody.

5.12.2 Suppliers shall notify the SBU/site prior to any alterations of accountable property and ensure all calibration requirement activities are coordinated with the applicable SBU/site.

- This list will include both the tooling/gages/fixtures supplied by a facility and the tooling/gages/fixtures fabricated by the supplier to manufacture contracted components but owned by its customer(s).
- The supplier receiving Collins Aerospace owned tooling/gages/fixtures shall return these after purchase order requirements are completed unless written authorization is received from buyer for an alternative, disposition, including retention by the supplier.
- The supplier shall submit a written request and receive a formal approval before any alteration or repair is performed on customer tooling/gages/fixtures using ASQR-01 Form 3.
- Once repair is performed on customer tooling/gages/fixtures, validation and verification must be conducted.
- The supplier is responsible for the repair of all supplied tooling/gages/fixtures damaged after receipt by the supplier, and for the preservation of tooling/gages/fixtures which are not in use.
- The supplier is responsible for the preventative maintenance of the tooling/gages/fixtures and shall have a document process.
- The supplier is responsible for the replacement or replacement costs of any tooling/gages/fixtures that are lost, damaged beyond repair, or not returned.
- All supplied tooling/gages/fixtures in the custody of a supplier are subject to periodic inventory audits and calibration.

5.13 PRODUCT INSPECTION CERTIFICATION

5.13.1 A Certification of Conformance / Compliance (C of C) shall accompany each shipment. The supplier C of C shall reference the approved manufacturer's catalog part number provided with the shipment. OEM C of C shall be provided by Supplier. Collins Aerospace reserves the right to request this documentation at any time.

5.13.2 A Certificate of Analysis provided by the issuer is accredited by ILAC (International Laboratory Accreditation Cooperation) should replace a C of C for raw materials and chemicals that assures conformance to all applicable material specification requirements.

5.13.3 If the SBU/site utilizes an electronic release system, that shall be used and satisfies the C of C requirement.

5.13.4 When required, either a FAA Form 8130-3 tag or EASA Form 1 or CAA UK Form 1 shall be included with each Product for airworthiness approval.

5.13.5 Chemical / Raw material certifications shall reflect actual values (not range), including mill data, and that the material certifications match the drawing, specification requirements including part number and revision.

5.13.6 Supplier shall verify product compliance from the certification received from sub tiers.

5.13.7 The C of C shall provide a statement of conformity (e.g., "I hereby certify the materials / service supplied was produced in accordance with the Purchase Order, applicable drawings and specification.") and at a minimum include applicable information from Table 1.

Table 1 - THE SUPPLIER C of C SHALL INCLUDE THE FOLLOWING INFORMATION:

1. Certificate of Compliance	11. Part name or description per PO line item
2. Name and address of the organization/supplier/manufacturer providing product to Collins Aerospace. Cage Code (as applicable)	12. Serial number(s) of parts delivered for serialized parts. If serialization is not required, Work Order or Batch/Lot number shall be provided.
3. Name and address of Collins Aerospace facility product is delivered to.	13. Date of Manufacture or Cure Date for elastomeric products
4. Date of C of C issuance	14. Purchase Order Line Item (or Line Item No.)
5. Country of Manufacture and Country of Origin if different, including USA manufactured parts	15. If applicable, non-conformance report number (QN, MRB #).
6. Part number including any applicable "dash" number as listed on PO and any other applicable part number if different from ordered.	16. Reserved
7. Quantity of parts delivered	17. Collins Aerospace Purchase Order number
8. Collins Aerospace Configuration Requirements	18. Signature or electronic signature and title of authorized supplier representative with date.

9. Full drawing revision including all applicable engineering documents (including Accepted/ Approved/ Automated Test Process/ Plan / Authorize to Release).	19. Source or DQR/ or Third-Party inspection stamp with date if applicable.
10. For assemblies ONLY, list of components (part of the assembly) with the following information: Part Number Drawing Revision, Part Name, Serial Number/Lot # (cure date), QN Number, Detail Part (As applicable)	20. The Special Process Certification shall include the special process being performed (shall match the drawing note including, the specification, class, type, and color where applicable).

5.14 RAW MATERIAL

5.14.1 The supplier shall develop, document, and implement a periodic raw material verification program that will ensure that material(s) received from the supplier's sub-tier sources meets the applicable technical and quality requirements.

5.14.2 Raw material validation shall be based on risk and SBU/site requirements.

5.15 FIRST ARTICLE INSPECTION (FAI)

5.15.1 Collins Aerospace requires the FAI be conducted per AS9102 and ASQR-01 requirements. Collins Aerospace may request a FAI at any time.

5.16 SPECIAL PROCESSES

5.16.1 When parts or materials require special processes, identified in a Collins Aerospace drawing or technical document, the supplier performing the special process shall be Nadcap approved for the process(es) being performed. The special processing supplier shall be approved for use by the Collins Aerospace SBU/site. Nadcap is a program designed to manage a cost effective consensus approach to special processing and products and provide continual improvement within the industry. A specific list of requirements can be found in the Corporate Family section of www.eAuditNet.com once logged in.

5.16.2 When parts or materials require approved special processes, a Special Process Certification shall be included with each production shipment. At a minimum, the Special Process Certification shall include traceability to the SBU/site Purchase Order number, the name and location of the certified special processor and the special process being performed (when applicable must match SBU/site drawing note including, I.E., the specification, class, type, and color).

5.16.3 Based on Product or Supplier Risk, Collins Aerospace may require:

- Custom Certificate of Conformance which certifies predetermined special process parameters.
- Frozen process plan monitoring requires management of manufacturing plans.
- Supplemental Collins Aerospace Special Process audits or Continuation Special Process Audits

5.16.4 Design Responsible Suppliers as defined in Appendix 1 shall work with their SBU/site to evaluate and document special process controls.

5.17 PRESERVATION OF PRODUCT

5.17.1 For shelf-life items, the Supplier shall provide information regarding the recommended storage conditions, shelf life, expiration dates, date of manufacturing or pot life requirements. This information should be located on either the container and/or requested certifications.

5.17.2 Safety Data Sheets (SDS) and Hazard Communication (HAZCOM) labels are applicable to the type of item purchased and shall be included in the shipment and shall be located on either the container and/or with the requested certification.

5.18 DROP SHIPMENTS

5.18.1 When authorized by the PO, suppliers can ship directly to customers or other Divisions using the supplier shipping documentation.

5.18.2 The supplier shall provide shipping documentation sent with product direct to Collins Aerospace or its representatives for Source Inspection and upon request.

5.18.3 The Collins Aerospace PO number shall be referenced on the shipping documentation.

5.18.4 When defined by Collins Aerospace SBU/site serialized drop ship product shall have the serial numbers recorded on the shipping document (shipper) and C of C.

5.18.5 When required on the purchase order by Collins Aerospace SBU/site, drop shipments are applicable to articles manufactured for use in the production of new products (aircraft, engines, or propellers). Drop shipments are not authorized for shipping new spare parts or details to aftermarket customers.

5.19 SUPPLIER PERFORMANCE

5.19.1 Collins Aerospace monitors their suppliers for risk and performance. This information will be used to manage oversight activities, including but not limited to the following:

- Audit frequency
- Corrective action plans
- Continuous improvement initiatives
- Increased level of inspection
- Onsite oversight by Collins Aerospace designated third party at supplier's cost
- 100% inspection on identified features
- Supplier Improvement Plans, Corrective Action Plan, or Zero Defect Plan (ZDP™)
- Capacity and Capability Assessments
- On-site investigations of known problems at the Special Process Supplier
- Other SBU/site requirements as required

5.19.2 Collins Aerospace may require additional oversight activities to be implemented within the supplier's supply chain.

5.20 ZERO DEFECT PLAN (ZDP™)

5.20.1 The Collins Aerospace Zero Defect Plan™ (ZDP™) is a systematic implementation of established Quality Engineering tools and processes that focuses on protecting the Customer from receiving non-conforming-materials.

The goal of the ZDP™ is to drive to zero non-conforming products. The ZDP™ methodology is defined in the "Zero Defect Plan™ How to Book", which can be provided upon request through CentralSupplierQuality@collins.com.

Collins Aerospace reserves the right to audit and/or require any supplier to submit the ZDP™ using the Collins Aerospace prescribed method and template. This will be done on a prescribed cadence until the elements of ZDP™ have been completed and are demonstrating results.

While all suppliers are expected to have an approach to achieving zero defects, Collins Aerospace could require formal execution using prescribed methods for any of the following (but not limited to):

- Escapes impacting Collins Aerospace and/or Collins Aerospace customers
- New development / key programs requirements
- First Pass Yield issues impacting quality or delivery
- Receipt of new work from Collins Aerospace

Execution of ZDP™, or equivalent methods, shall be extended to members of the supply chain (e.g., sub tier suppliers) when those members are posing risk to Collins Aerospace or its supplier (see above for examples).

5.20.2 Suppliers shall use Manufacturing Process Review (MPR) or equivalent process to evaluate if manufacturing operations and processes are capable of consistently producing a product compliant to the design specifications and to define corrective actions to mitigate the sources of variation identified as part of the review. The MPR instructions can be found in the "ZDP™ How To Book."

5.20.3 Evidence of execution of ZDP™ shall be made available and/or provided upon request from Collins Aerospace demonstrating execution progress. The "ZDP™ How To Book" contains the evidence requirements such as QC Actions implementation, QC Inspection progress, ZDP™ Planning and Execution Table and leading indicators table.

5.20.4 Suppliers implementing and currently engaged in ZDP™ shall submit updates and changes made to their Zero Defect Plan™ and provide periodic updates to their ZDP execution lead.

5.21 SUPPLIER SAMPLING REQUIREMENTS

5.21.1 In supplement to product sampling requirements outlined in ASQR-20.1 – Supplier Sampling Requirements, Collins Aerospace SBU/site may employ requirements for Statistical FAI (sFAI). SFAI requires that for sample inspection to be applicable, every quantitative (variable) feature on the design blueprint is measured on a 25-piece sample. Further information on sFAI can be found in the "ZDP™ How To Book", which can be provided upon request through CentralSupplierQuality@collins.com.

5.21.2 If a part or site has a history of dimensional escapes then a high priority corrective action should be too complete a sFAI for each part as designated by the SBU/site.

5.21.3 A machine capability study should be used for dimensions produced by the same machine and process as an alternative to measuring every dimension on a specific Part Number.

5.21.4 Alternatives for demonstrating process control can be used with Collins Aerospace SBU/site approval.

5.21.5 If due to nature of complex castings, complex machining, or composite molds destructive analysis is required to perform variable measurements then an alternative approach can be used in place of sFAI to demonstrate process capability. The supplier should submit an alternative inspection plan via ASQR-01 Form 3. This plan shall identify controlling dimensional characteristics (not 100% inspected). The inspection plan shall identify in-process dimensional verification using such methods as laser scan, checking fixture, ultrasonic wall check, and targeting and scribe fixture to ensure that the process is production ready and dimensionally representative of a production part and meets the design requirements.

5.21.6 Torque values do not require sFAI measurements.

5.21.7 SFAI does not apply to categorical (attribute) features that have either Binary (i.e., presence or absence) or a fixed number of values (i.e., count).

5.21.8 Reference dimensions and “approximate” dimensions do not require sFAI measurements.

5.21.9 SFAI will be performed on lower-level parts and assemblies.

5.22 QUALITY CONTROL ACTION REQUIREMENTS

5.22.1 The quality control action requirements captured in the table 3 shall be implemented by all Suppliers in accordance with the applicability listed in Table 2.

The requirements in Table 4 are intended to eliminate common categories of non-conforming material that have been identified through an evaluation of the Collins Aerospace value stream’s (Collins Aerospace and Suppliers) past performance and escapes. Table 4 includes the following:

- New requirements to protect customers from known non-conformances.
- Enhance and reinforce existing requirements to ensure uniformity.

Quality control action applicability – Table 2 is used to communicate where the requirements in Table 3 are applicable.

COL-FRM-0087 may be used to capture Table 4 information, objective evidence, and gap closure plans.

Any exceptions to these requirements shall have documented approval from Collins Aerospace using ASQR-01 Form 3.

Table 2: Quality Control Action Requirements- Applicability

Requirement Category	Applicability
Assembly	All assembly processes
Circuit Card Assembly	Circuit Card Assembly Processes
Customer Interfaces	All customer interfaces
Dimensional	All measuring & dimensional inspection equipment
Material Integrity	All parts with material certificates of compliance (C of C)
O-rings	All O-ring suppliers and product assemblies with O-rings
Packaging, Shipping & Handling	All parts
Part Marking	All parts with required part marking
Product Handling Equipment	All product handling equipment
Rework	All rework operations
Special Processes	All Special Processes as defined by Collins Aerospace.
Torque	All torque operations with a required applied torque value
Visual Standards for Cosmetic Defects	Products / product families with historically disputed cosmetic conditions

Table 3: Quality Control Action Requirements

Category	#	Requirement	Objective
Assembly	1	Overruling of an automated inspection device (i.e., a false call disposition) shall require review and disposition by an independent, site-qualified technician or engineer.	Prevent actual failures from mistakenly being passed and provide feedback to line to correct process variation.
	2	Look-alike parts shall 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.	Mitigate risk of an inadvertent use of look-alike parts.
	3	The supplier shall assess the build process for points where hidden features are created and align inspection control plans & methods to ensure all features are verified while accessible.	Mitigate risk associated with features that cannot be verified at later steps.

Circuit Card Assembly	1	Circuit card assembly suppliers shall utilize 3D AOI to ensure correct components, component placement, solder joint integrity, correct heel fillets, absence of lifted leads, and other visually detectable defects per IPC-A-610. Where board geometry restricts access by 3D AOI methods, alternate inspection methods with equal capability to 3D AOI shall be used to verify conformity. Overruling of an automated inspection device (i.e., a false call disposition) shall require review and disposition by an independent, site-qualified technician or engineer.	Eliminate escapes due to assembly and/or process errors and from automated and manual inspection methods.
	2	For all new programs, AOI shall not be based on automated assembly but shall be based directly on engineering definition (BOM). For existing programs, the AOI code shall be 100% checked back to the engineering BOM.	In order to eliminate the customer being the first location where intermittent operation due to wrong/ missing components or improperly incorporated engineering changes are detected. Test systems do not always detect these issues. It is common in the industry to use engineering circuit card assembly definition to program an automated assembly process and then take the code from automated assembly and use that to program automated optical inspection. The intent of this is to avoid a mistake being made in automating assembly and then being carried over to automated inspection so that the error goes undetected.
Customer Interfaces	1	100% of interface and alignment features identified by Collins Aerospace shall be verified by physically engaging the feature with a fixture identically mimicking the mating surface where Collins Aerospace has provided the definition of 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	Ensure no installation escapes to Customer.

Customer Interfaces	1	physical location shall be documented on the process control plan. Visual alignment features (e.g., scribe lines and connector labeling) shall be 100% visually inspected. Poke-Yoke inspection fixtures should be used wherever possible for these inspections.	Ensure no installation escapes to Customer.
	2	100% of un-mated electrical connectors shall be inspected at final inspection for bent pins, pushed pins, and FOD. (Redundant per ASQR-20.1 Table C.)	
Dimensional	1	All measurement and dimensional inspection equipment shall comply with AS13003.	Reduce dimensional escapes associated with gage variation.
Material Integrity	1	For all material Certificates of Conformance (C of C), the supplier shall verify 1) raw material back to the original mill, 2) Certificate of Assurance (C of A) matches PO/ Drawing requirements, and 3) C of material properties report as required by material specification.	Ensure that the material represented by the C of C is the material specified by the design.
O-Rings	1	100% O-Rings shall be lubricated prior to installation, unless otherwise instructed per Purchase Order. Only appropriate lubricates shall be used unless otherwise specified or approved by Collins Aerospace. Petroleum based lubricants shall not be used unless approved by Collins Aerospace.	Ensures all lessons learned regarding best practices for O-Ring assembly are acknowledged by supply base and incorporated into suppliers' processes to minimize risk of O-Ring failures.
	2	Plastic or protected metal caps shall be used to protect O-Rings or other seals from damage during handling or installation. Protected metal caps shall always be kept in protective enclosure to prevent raised burrs due to damage.	
	3	Slide or push O-Rings or other seals into place (i.e., do not roll into place).	
	4	When mating parts with O-Rings or other seals, positive alignment tooling shall be used to prevent blind cutting of seal due to misalignment	

Packaging, Shipping & Handling	1	All shipments shall comply with ASTM D3951 unless otherwise specified by purchase order or contractual flow down.	Ensure parts are adequately protected for shipment.
	2	Qualified individuals shall define and execute a process compliant with DOT 49 CFR and/or IATA Dangerous Goods Regulations for all dangerous goods shipments.	Ensure compliance with DOT & FAA regulations for shipping. Hazardous Materials to avoid danger & potential fines.
	3	With the exception of Bulk Bought hardware parts, all parts shall be protected from part-to-part contact during shipment. Parts damaged during shipment due to inadequate packaging shall be considered escapes to Collins Aerospace.	To eliminate escapes caused by part to part damage while in transit. To eliminate escapes caused by part to part damage while in transit.
	4	O-rings shall be packaged and marked in accordance with AMS2817.	To assure O-rings are adequately protected & identified per industry standards to eliminate escapes.
Part Marking	1	Part marking inspection and verification procedures shall include a photo or other replica of required content, format, marking method, and location per contract specifications. All features of marking shall be 100% verified including machine readable matrix marking, human readable markings related to 2D machine matrix, independent human readable markings where specified, traceability (serialization, lot date codes, etc.), and radio-frequency identification.	Contain non-conformances in part marking prior to shipment.
	2	All 2D machine readable matrix marks shall be verified with software capable of creating validation and verification. Reports of this verification shall be included in shipping paperwork.	Contain errors in 2D machine readable matrix marks prior to shipment.
	3	Prior to shipment, all suppliers shall have a process to detect and contain serial number duplication.	Prevent the shipment of duplicate serial numbers.
	4	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 shall be implemented in addition to final inspection. Note: A best practice for an over inspection is to have one person read the part marking data on the part out loud while the second verifies the data in the associated paperwork.	Contain non-conformances in part marking prior to shipment.

Product Handling Equipment	1	The receiving, manufacturing, assembly, special process, test, storage, shipping processes, and transitions between processes shall be reviewed to eliminate material-to-material contact that could damage the part / product. a. Material handling containers and equipment shall be visually identified and designated for specific use. Material handling containers include any totes, bins, boxes, etc. used to handle the product or parts throughout the product life cycle at the targeted facility. b. Materials and construction of product handling equipment shall be compatible with part materials, part geometry, and environmental conditions.	Prevent handling damage in process operations, transportation between processes, storage, and shipment.
	2	All product handling equipment shall 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.	Ensure that part protection is maintained over time and to mitigate the generation of FOD as protective materials break down.
Rework	1	Any characteristics which should be directly or indirectly affected by rework operations shall be identified and re-verified (e.g., re-inspected, retested, environmentally screened, etc.) immediately following rework operations to ensure that operations have not cause direct damage, collateral damage, or introduce contamination. Sampling inspection shall not be permitted for characteristics affected by rework.	Identify any potential non-conformances introduced during rework operations. Ensure previously verified requirements are not impacted as a result of the rework or repair operation.
Special Processing	1	Non-Destructive Testing (NDT) – Independent Verification and Validation (IV&V): In addition to requirements of NAS410, an independent verification and validation of NDT by the Supplier(s) Responsible Level 3 or qualified Level 3, Third party NDT shall be put in place. The documented program shall include criteria that meets the following for all Collins Aerospace parts: • Assure the source is a Collins Aerospace BU Approved NDT source as defined in P.O.	Ensuring conformance to Special Process requirements. Assure that all special processes are controlled and verified with changing of process or suppliers and any major events at the Special Process supplier.

Special Processing	1	• Document and record an audit program on 25 random Collins Aerospace parts per each NDT method annually. Witness and ensure the proficiency of each certified inspector performing each NDT method. The review shall include compliance to approved customer techniques, engineering requirements, specifications, and supplier techniques. • Provide access to Collins Aerospace for oversight IV&V audits and reviews of records to ensure compliance with requirements. Where NDT processes are outsourced, the above requirements shall be flowed and executed by the source.	Ensuring conformance to Special Process requirements. Assure that all special processes are controlled and verified with changing of process or suppliers and any major events at the Special Process supplier.
	2	Suppliers that utilize parts that have been Heat Treated shall verify that material properties test results identified in the associated specification are included on the C of C (e.g., hardness, conductivity, tensile, etc.).	Address systemic gap in Heat Treat supplier compliance across Collins Aerospace.
	3	Suppliers that utilize anodized parts shall verify that material properties test results identified in the associated specification are included on the C of C (e.g., conductivity, etc.).	Address systemic gap in Anodize supplier compliance across Collins Aerospace.
	4	Special Process (SP) Change Management: The Supplier is responsible to ensure SP and SP sources meet the drawing/specification requirements through initial validation of either a number of pieces and/or lot testing. Unless otherwise notified by the Collins Aerospace SBU/site, the default is the Supplier's validation of 25 pieces, spanning at least 3 lots where lot processing is conducted. Validation may require product measurements, review of the processing information and/or non-destructive means up to and including destructive testing where required. The validations shall be completed by the Producer's Quality Manager/designee or responsible NDT L3. Revalidation shall be accomplished for process changes and shall mimic the validation for each part number where the process changed. The SP categories as listed in the Corporate Family section of www.eAuditNet.com shall require validation.	Ensure Special Processes are controlled. Assuring that all special processes are locked down and no changes are made unless reviewed. Assure that any changes to special processes are thoroughly justified before being implemented to mitigate the creation of new nonconformances and reverified process changes and for any major events at the SP supplier.

Special Processing	4	Validation of any SP will be documented and submitted to Collins Aerospace SBU for review. In addition, revalidation of SP shall be required for the following events at a SP facility: SP Disclosures, Advisories, Potential Ensuring conformance to Special Process requirements. These validation requirements as listed above are in addition to ASQR-20.1, Supplier Sampling Requirements - paragraph 4.2.4.2 requirements. Once the validation is completed then the requirements of ASQR-20.1 are invoked. When specified on the drawing or PO, Suppliers shall use only sources approved by the specific Collins Aerospace SBU/site to perform these special processes (each SP supplier shall obtain initial approval from each specific member company).	Ensure Special Processes are controlled. Assuring that all special processes are locked down and no changes are made unless reviewed. Assure that any changes to special processes are thoroughly justified before being implemented to mitigate the creation of new nonconformances and reverified process changes and for any major events at the SP supplier.
Torque	1	A validation of torque tool settings and output (for all aspects of torque defined in the requirement i.e., running prevailing, breakaway, final) shall be performed and recorded against acceptance criteria, using a torque tester, per the following: • For manual torque tools validation shall be performed a minimum once per shift using a stationary tester and defined validation range requirements for each torque tool. • For auto or clutch torque tools, validation shall be performed a minimum once per month using a rotary tester and defined validation range requirements for each torque tool. • For auto torque tools, the software validation shall include validation of all required torques (i.e., running, prevailing, final, etc.)	Validate that the torque tool is set properly and that the tool output is within defined validation range requirements.
	2	After final torquing, all fasteners shall 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. For automated torque tools with angle monitoring enabled, this does not apply.	Ensure that each torqued fastener has been torqued to at least the minimum value. This also ensures that none of the torqued fasteners were loosened by torquing additional fasteners within the operation.

Torque	3	When selecting a torque tool, the following requirements shall be adhered to: • The increment between two graduations marks of a scale shall be in compliance with ISO 6789. • The increment between two graduation marks of a scale shall not exceed 10% of the total torque tolerance on the drawing. • The torque setting of the tool shall be within a set range in compliance with ISO 6789	Ensure that the gage used in applying torque is capable of providing the required resolution.
	4	If used, torque tool extenders shall be defined on the work instructions with tool identification numbers and specific use configuration. The torque range values shall 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 shall be validated in the as-used configuration per Torque Requirement 1.	Prevent accidental over-torquing of fasteners due to the use of unspecified or improperly utilized torque wrench extensions (e.g., crow foot, or dog bone).
Visual Standards for Cosmetic Defects	1	The supplier shall establish mutually agreed to visual standards for acceptable and unacceptable cosmetic conditions with the SBU/site for features, parts, and product families that have historically disputed defects. (e.g., provide common photo set to OEM inspector and SBU/site inspector). These standards shall be documented in a revision-controlled document and a copy will be provided to the SBU/site for their review and comment. Note: Examples of cosmetic conditions include nicks, scratches, dents, surface finish characteristics, etc.	Eliminate ambiguity between customer and supplier expectations regarding visually detectable anomalies that are neither explicitly prohibited nor allowed by existing design documents.

6.0 SUPERSEDED DOCUMENT(S)

COL-ASQR-PRO-0003-01

7.0 FLOWCHART(S) N/A

8.0 APPENDIX

Appendix 1 - Supplier Definition Table for Applicability

Supplier Type	Definition
Type 1: Build to Print (BTP) – Collins Aerospace Member Design Part Manufacturer	BTP – Collins Aerospace Member Design Part Manufacturer Supplier of products and/or assemblies with Member-designated part numbers as defined on proprietary Member drawings or other technical definitions (also known as Build To Print (BTP) parts). Note 1: Castings and forgings are considered BTP – Collins Aerospace Member Design Parts Note 2: This includes suppliers that purchase parts from third parties manufactured against Member proprietary drawings even though they may not add any additional value themselves.
Type 2: Design Responsible Supplier	Supplier of products defined by a design/drawing proprietary to that supplier and linked to a Member part number using a Member-referenced drawing and/or other purchase order requirements (e.g., Category 1, Source Control, Source Design, Engineered Item). Note: Member-referenced drawings may contain additional Member requirements in addition to ASQR-01 requirements.
Type 3: Distributor (any product type)	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.
Type 4: Special Process Supplier	Supplier that only provides special processes on Member products (i.e., not a part manufacturing supplier).
Type 5: Calibration or Laboratory Service Provider	Organization qualified to perform calibration services on Measuring and Test Equipment (monitoring and measuring equipment) used in the production of Member products.
Type 6: Industry Standard Part or Industry Standard Raw Material Manufacturer	Manufacturer of raw material that conforms to an established industry or national authority-published specification (e.g., Aerospace Material Specification (AMS)

Suppliers shall use ASQR-01 Figure A1 to identify which of the Supplier Types defined in Appendix 1 that applies to their organization.

Appendix 2 – Applicability Table

COL-ASQR-PRO-0003 Section	Type 1: BTP - UTC Member Design Part Manufacturer	Type 2: Design Responsible Supplier	Type 3: Distributor (any product type)	Type 4: Special Process Supplier	Type 5: Calibration or Laboratory Service Provider	Type 6: Industry Standard Part or Industry Standard Raw Material Manufacturer
5.1.1	X	X	X	X	X	X
5.1.2	X		X			
5.1.3	X		X			
5.2.1	X	X	X	X	X	X
5.3.1	X	X	X	X	X	X
5.3.2	X	X	X	X	X	X
5.3.3	X	X	X	X	X	X
5.3.4	X	X	X	X	X	X
5.4.1	X	X	X	X	X	X
5.5.1	X	X	X	X	X	X
5.5.2	X	X	X	X	X	X
5.6.1	X	X	X	X	X	X
5.7.1	X	X	X	X		
5.7.2	X	X	X	X		
5.8.1	X	X	X	X	X	
5.8.2	X	X	X	X		
5.9.1	X	X	X			X
5.9.2	X	X	X			X
5.10.1		X				
5.10.2		X				
5.11.1	X		X			
5.12.1	X	X	X	X	X	
5.12.2	X	X	X	X	X	
5.13.1	X	X	X	X	X	X
5.13.2	X	X	X	X	X	X
5.13.3	X	X	X	X	X	X
5.13.4	X	X	X	X	X	X

COL-ASQR-PRO-0003 Section	Type 1: BTP - UTC Member Design Part Manufacturer	Type 2: Design Responsible Supplier	Type 3: Distributor (any product type)	Type 4: Special Process Supplier	Type 5: Calibration or Laboratory Service Provider	Type 6: Industry Standard Part or Industry Standard Raw Material Manufacturer
5.13.5	X	X	X	X	X	X
5.13.6	X	X	X	X	X	X
5.13.7	X	X	X	X	X	X
5.13.8	X	X	X	X	X	X
Table 1	X	X	X	X	X	X
5.14.1	X	X	X			
5.14.2	X	X	X			
5.15.1	X	X				
5.16.1	X			X		
5.16.2	X	X		X		
5.16.3	X	X		X		
5.16.4		X				
5.17.1	X	X	X	X	X	X
5.17.2	X	X	X	X	X	X
5.18.1	X	X	X			X
5.18.2	X	X	X			X
5.18.3	X	X	X			X
5.18.4	X	X	X			X
5.19.1	X	X	X	X	X	X
5.19.2	X	X	X	X	X	X
5.20.1	X	X	X			
5.20.2	X	X	X			
5.20.3	X	X	X			
5.20.4	X	X	X			
5.21.1	X	X	X	X		
5.21.2	X	X	X	X		
5.21.3	X	X	X	X		
5.21.4	X	X	X	X		
5.21.5	X	X	X	X		

COL-ASQR-PRO-0003 Section	Type 1: BTP - UTC Member Design Part Manufacturer	Type 2: Design Responsible Supplier	Type 3: Distributor (any product type)	Type 4: Special Process Supplier	Type 5: Calibration or Laboratory Service Provider	Type 6: Industry Standard Part or Industry Standard Raw Material Manufacturer
5.21.6	X	X	X	X		
5.21.7	X	X	X	X		
5.21.8	X	X	X	X		
5.21.9	X	X	X	X		
5.22.1	X	X	X	X	X	X
Appendix 1	X	X	X	X	X	X
Appendix 2	X	X	X	X	X	X

X indicates which section of COL-ASQR-PRO-0003 is applicable to which Supply Type.

9.0 REVISION HISTORY

00	Initial Issue	January 2, 2019
01	Joint BU discussion and revision of similar processes	October 7, 2019
02	Updates were made to the entire document by SBU/sites collaboration discussions and reviews. Supplier Type definitions and Applicability Table were added to the Appendix of this document.	June 7, 2021