Collins Aerospace
Hamilton Sundstrand
Windsor Locks, CT 06096

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# SUPPLIER QUALITY REQUIREMENTS

**APPROVALS:**

| | | |
|---|---|---|
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# 1.0 PURPOSE

Collins Aerospace is a Raytheon Technologies Corp (RTX) company. This document is applicable to the following Collins Aerospace business units: Power & Controls (P&C) and Global Operations.

The purpose of this document is to define requirements that are in addition to COL-ASQR-PRO-0003 'Supplier Quality Requirements'. This includes the requirements of the Delegated Quality Representative (DQR) Program.

**Note:** Collins Aerospace Power & Controls and Global Operations, formerly UTAS ES, Electric, Environmental & Engine Systems (heritage Hamilton), will be referred to as Collins in this document.

# 2.0 SCOPE

## 2.1 SUPPLIER QUALITY REQUIREMENTS

HSM17 shall be applicable as flowed down on the Collins' Purchase Order and defines requirements that are in addition to COL-ASQR-PRO-0003. Any applicable requirements shall be flowed to the supplier's sub-tiers.

Note: HSM17 is not applicable to RTX and Collins subsidiaries (i.e., internal plant sites).

## 2.2 DELEGATED QUALITY REPRESENTATIVE (DQR) PROGRAM

The DQR program enables a Collins-approved supplier representative to perform over inspection activities and release product shipments on behalf of Collins. Suppliers shall use the DQR process for all shipments of Collins product to Collins facilities or drop ship product to Collins customers. DQR terms and conditions shall be documented in a Letter of Agreement (ASQR-01 Form 8) between the supplier and Collins.

Direct ship authority will be granted by Collins on a separate Letter of Agreement, as needed.

# 3.0 DEFINITIONS

- **ADVANCED SHIPPING NOTIFICATION (ASN):**
  Shipping notification created by the supplier through the Supplier Portal. ASNs allows the package to be identified and received at Collins, and triggers payment to the supplier. ASNs are created after the iLot has been generated.

- **BULK PACKAGING:**
  Parts that are too small to be individually stamped, typically high volume, low cost, manufactured or specifically designated parts (i.e., bag of industry standard washers, nut, etc.)

- **COMMERICAL OFF THE SHELF (COTS):**
  Commercially available items intended by design to be procured and utilized without modification (e.g., common electronic components, Standard Catalogue Item). Any item purchased from a catalogue available to the public is considered a Standard Catalogue Item.

- **CONTRACT QUALITY ASSURANCE REPRESENTATIVE (CQAR):**
  Third Party Contract Quality Assurance Representatives approved by Collins to perform duties and responsibilities of Collins Supplier Quality Assurance Representatives (SQAR). CQARs are delegated product acceptance and release authority.

- **DIGITAL PRODUCT DEFINITION (DPD):**
  The electronic data elements that specify the 3D Computer Aided Design (CAD) geometry and all design requirements for a product (including notation and parts lists), and the use of this data throughout an integrated CAD/Computer Aided Manufacturing (CAM) and Coordinate Measurement Systems (CMS). It is the effective control of digital media files that are directly used to create (directly or indirectly) manufactured items.

- **PART PER MILLION DEFECT (PPM) RATE:**
  PPM is a metric used to determine a supplier's performance based on receipt and acceptance of product and is calculated as follows.

$$\text{PPM} = \frac{\text{Number of Pieces Rejected}}{\text{Number of Pieces Received}} \times 1{,}000{,}000$$

- **DELEGATED QUALITY REPRESENTATIVE (DQR):**
  A supplier representative (employee) approved by Collins to perform Source Inspection and related duties (formerly referred to as DSQRs).

- **ESCAPE:**
  An escape event is defined as parts and other delivered products that do not meet contractual requirements.

  Significant Escape: A safety related escape or an escape resulting in considerable business impact (e.g. causing significant customer installation or assembly line stoppage, removal/tear down, inventory recalls or missed deadlines or contracts).

- **FIRST ARTICLE INSPECTION REPORT (FAIR):**
  A First Article Inspection Report is to give objective evidence that all engineering, design, and specification requirements are correctly understood, accounted for, verified, and recorded. First Article Inspection Reports shall be performed accordance with SAE AS9102 and HSM236.

- **INSPECTION LOT (iLot):**
  An electronic Inspection Record generated by an approved individual using the Collins Supplier Portal. The record applies to a specific quantity of parts inspected at a given time and provides the status of inspection approval based on provided requirements.

- **MISH LIST (**Military Industry Standard Hardware**):**
  A list of standard parts that are defined by Mil-Spec or industry standard that do not require an iLot. SSI is not required for these parts, however an ASN is still required. The MISH list is available on the Supplier Portal.

- **PRODUCTION PART APPROVAL PROCESS (PPAP):**
  PPAP is used to validate that the production process has demonstrated the potential to produce products that consistently fulfill all Member requirements while operating at the customer demand rate.

- **QUALITY NOTIFICATION (QN):**
  SAP record for documenting and processing potentially nonconforming product.

- **SUPPLIER CORRECTIVE ACTION REQUEST (SCAR):**
  A request for Containment, Root Cause and Corrective Action related to an audit finding or non-compliance.

- **SUPPLIER PORTAL**
  Raytheon Technologies Corp (RTX) / Collins Aerospace Supplier Portal is a web-based method to communicate between suppliers and Collins. It includes Purchase Orders, Supplier Contract Flow down, SSI, Quality Forms, SRI, QN, News, and Help & Training. Access can be obtained through the supplier's Portal Admin. suppliers.utc.com

- **SUPPLIER SOURCE INSPECTION (SSI)**
  Supplier Source Inspection (SSI) is a web-based tool that collects data necessary to release product (Lot Date Codes, Serial Number, Key Characteristics, Materials, etc.) and makes information readily available for use. It allows direct shipment to point of use, bypasses Collins Receiving Inspection, triggers payment, influences Supplier Ratings and other systems.

- **SUPPLIER QUALITY ASSURANCE REPRESENTATIVE (SQAR):**
  A SQAR is a Collins employee approved to perform functions as defined by this procedure as well as applicable Collins procedures. The SQAR is the supplier's primary contact for quality compliance related items such as iLots, DQRs, Flight Safety, and general quality compliance.

# 4.0 SUPPLIER QUALITY REQUIREMENTS

## 4.1 SUB-TIER MANAGEMENT

The supplier holding the Collins Purchase Order has the responsibility to ensure that all applicable Collins contract requirements are flowed down through the supply chain.

The supplier holding the Collins Purchase Order has the responsibility to manage performance and escapes of the supply chain, including castings, forging, special processes, Collins directed suppliers, etc. This includes requesting corrective action and processing V1 QNs.

For Flight Safety Releases, HSC16199 requirements shall be followed and flown down to the sub-tier suppliers, as applicable.

### 4.1.1 Form 34

For all supplier-to-supplier shipments for castings, forgings, and flight safety parts, COL-FRM-0034 shall be used. The completed COL-FRM-0034 shall be approved by a Collins approved DQR or authorized Collins Delegate. This information shall be considered a Quality Record and be retained per requirements.

For supplier-to-supplier shipments other than castings, forgings or flight safety, suppliers may use COL-FRM-0034. The completed COL-FRM-0034 may be approved by a qualified person designated by the supplier that is certifying the parts.

## 4.2 DESIGN RESPONSIBLE SUPPLIER

Design Responsible Suppliers shall establish and maintain documented procedures to control and verify the design of the product in compliance with CEP100, Hamilton Sundstrand Supplier Configuration Management Requirements.

## 4.3 CASTINGS AND FORGINGS

All Collins designed castings and forgings shall be procured from a Collins approved supplier listed on the Collins Report 80.

All casting and forging FAIs shall be submitted through Net Inspect and approved by Collins prior to shipment to Collins or a Collins supplier.

All castings requiring radiographic inspection shall be serialized and the x-ray film retained by the supplier.

## 4.4 SUPPLIER REQUEST FOR INFORMATION (SRI)

The Supplier Portal is used to communicate between Collins and suppliers. This includes a central database for electronically tracking progress and ownership of COL-ASQR-FRM-0003 (SRIs), as well as maintaining a permanent record. The SRI workflow can be found on the Supplier Portal under the Quick Links. A complete tutorial is available under Help & Training.

An SRI shall be submitted through the Supplier Portal and may be used for items such as:

1. Lack of clarity or definition in a drawing or specification
2. A request for an alternate method to a quality system requirement
3. A request for a change to the Collins drawing or specification
    - An Engineering Change Request Form is required to be submitted with the SRI. This can be found on the Supplier Portal, under Quality Forms & Documents
4. To report an anomaly or non-conformance identified from a CAI (Current Article Inspection). For notification only and not used to disposition parts.
5. Notification of change in Collins' account representatives including Quality Manager and Quality Engineer.
6. Notification of major business changes that may affect Collins, including name changes, mergers, and acquisitions.
7. The below forms shall be attached and submitted on an SRI:
    - COL-ASQR-FRM-0002 (Supplier Process Change Notification)
    - ASQR-01 Form 4 (Work Transition)
    - COL-ASQR-FRM-0006 (Notification of Potential Quality Escape - NOPQE)
8. Requests for Minor MRB authority (reference section 4.9.2)
9. Direction or request for using superseded specifications (reference section 4.12)
10. Request to add a new supplier to the Report 80/85 (reference section 4.13)

## 4.5 WORK TRANSFERS

All Supplier Managed Work Transfers shall be submitted to Collins for approval per COL-ASQR-PRO-0003 prior to commencement of the work transfer. ASQR-01 Form 4 shall be submitted on an SRI. Reference HSM17 Appendix 3 for guidance on common changes and work transfers.

Examples of work transfers that will require Collins approval include, but are not limited to:

- Outsourcing or offloading part of their manufacturing process
- Outsourcing or offloading the entire manufacturing process
- Supplier and sub-tier site moves

For all offloads, the Collins supplier (PO holder) is required to ensure all Collins requirements are flowed down to their suppliers. This is to include, but not limited to, flow down of all applicable purchase order requirements, quality requirements (COL-ASQR-PRO-0003, HSM17, HSM19, HSM236), engineering design and specification requirements, raw material, and special processing requirements.

The Collins supplier is responsible to ensure all applicable documents and specifications are at the latest revision and available to their suppliers.

The supplier shall validate all offloaded features, characteristics, and compliance to Collins requirements. Evidence of flow-down and product validation shall be available as requested by Collins.

## 4.6 SAMPLING

Product acceptance inspection shall be 100% for all characteristics until the inspection requirements of ASQR-20.1 or AS9138 have been achieved. Additionally, prior to moving to sampling, a minimum of 25 pieces shall be 100% inspected with no nonconformances and have documented evidence. Approval of alternate inspection frequency plans shall be requested through an SRI.

**4.6.1 Sampling Clarification for Distributors:**

1. Electronics require 100% visual inspection
2. COTS or HSCOTS per HSM236 require 100% visual inspection and verification of C of C from Manufacturer
3. Tape and reel require inspection of packaging and documentation
4. BTP (Build to Print Drawings):
   - Distributor is responsible for verifying that the Manufacturer is compliant to ASQR-20.1 or AS9138 inspection (this includes oversight by the Distributor)
   - Or the Distributor can perform the inspection themselves.

## 4.7 PRODUCT AND PROCESS VALIDATION

Collins Aerospace reserves the right to invoke product and process validation in accordance with AS9138. This may include measurement system analysis (MSA), capability studies, etc.

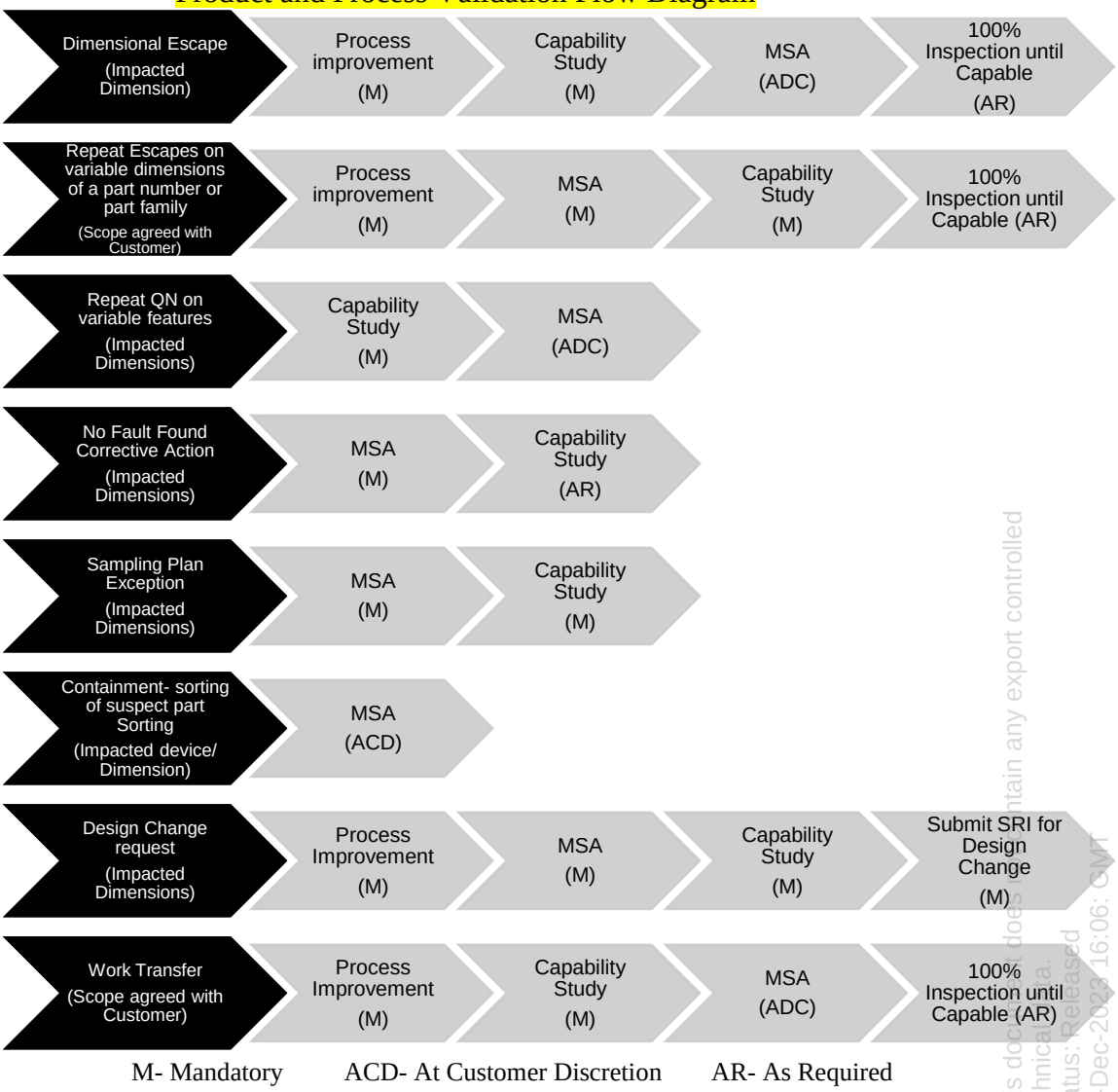
Product and process validation may be required in the events such as, but not limited to, customer escape, corrective action, quality notification (QN), sampling reduction requests or manufacturing change. Reference the below flow diagram for guidance on applicable methods and sequence. Product and process validation is most effective at the point of manufacturing.

Collins may invoke key characteristics per HSC16199. In the event of a quality nonconformance, Collins may flow down TKCs (Temporary Key Characteristics). It is the supplier's responsibility to ensure compliance with HSC16199 and to verify all applicable controls have been implemented.

When specified by Collins, the supplier shall use identified systems (COPS/ Net Inspect) to capture production process verification data (e.g., MSA, process capability).

If the characteristic or part in review is manufactured by a sub-tier supplier, it is the PO holder's responsibility to flow down applicable requirements to the manufacturer.

Product and Process Validation Flow Diagram




M- Mandatory ACD- At Customer Discretion AR- As Required



## 4.8 PPAP

1. Collins reserves the right to invoke ASQR-09.2, “Production Part Approval Process”, based on various risk assessments. The Supplier is responsible for ensuring compliance to this specification when invoked by the Collins PO. PPAP forms and training material are available on the Supplier Portal.

   a. The supplier shall not ship PPAP parts until receiving from Collins a signed PPAP Form 1 with Full Approval, Interim Approval, or an authorized deferral.

b. The supplier shall ensure completed PPAP Objective Evidence file is maintained per the requirements defined in ASQR-09.2. The supplier shall retain the PPAP Form 1 on file at the supplier's site.

c. If PPAP Form 1 is approved with either Interim A or B approval or a deferral, it is the supplier's responsibility to assure that the assigned actions are closed per the supplier commitments on the form. The supplier shall not continue to ship parts if the actions lapse.

## 4.9 NONCONFORMING MATERIAL

The supplier shall establish and maintain documented procedures to ensure product not conforming to a specified requirement is prevented from unintended use or installation. This control shall provide for identification, documentation, evaluation, segregation (when practical), disposition of nonconforming product, and for notification to the functions concerned.

Collins reserves the right to reject nonconforming parts. Any product built at risk (prior to an approved Engineering Change, Deviation, or QN) is considered nonconforming. Any product delivered prior to formal Collins approval is considered an escape. Suppliers are responsible for control within their quality management system.

### 4.9.1 Critical/Major Nonconformance (TYPE 1)

Critical/Major Nonconformance includes anything that affects fit, form or function (that could by itself, or by relation to other components, affect system or end item specification, reliability, weight, safety, and appearance when it is a significant factor.

Nonconforming items of Collins design or supplier design must be dispositioned by Collins Material Review Board (MRB) before goods or services are delivered. Disposition by Collins MRB may be obtained by submitting a V1 QN per 4.9.3.

The supplier shall not proceed with a repair procedure unless authorized by Collins MRB.

### 4.9.2 Minor Nonconformance (TYPE II)

Minor Nonconformance is defined as any departure from requirements not falling into the category of Critical/Major Nonconformance.

When delegated by Collins, Suppliers may perform Minor material review actions on proprietary products. These Minor Nonconformance dispositions shall be made available upon Collins request.

Requests for Minor MRB authority by specific product types are to be submitted to Collins via SRI. Collins will review the suppliers' Quality Management System and MRB controls to determine if delegation is possible. This may include, but is not limited to, review of the supplier's procedures related to training, internal audits, documentation, record retention, and traceability of non-conforming product.

Collins authorizes the supplier's Minor MRB approval by issuing letter of delegation. The delegation will specify the approval level and any specific restriction or instructions. Collins reserves the right to refuse MRB delegation.

Suppliers providing standard catalog items or commercial off the shelf (COTS) items are not required to request Minor MRB authority.

### 4.9.3 Supplier Initiated Quality Notification (V1 QN)

V1 QN, previously known as a CAD (Conditional Advance Disposition), is used to request Collins MRB disposition for nonconformances identified by the supplier prior to shipment and submitted to Collins through the Supplier Portal.

If nonconforming material is detected during the manufacturing process that requires 'accept as is' or 'repair' disposition from Collins, the Supplier is responsible for ensuring the following:

1. QN has been generated and submitted (including root cause and corrective action).
2. QN has been dispositioned and approved by Collins prior to shipment.
3. Requested repair activity is completed and conforming to requirements.
4. Supplier has implemented corrective action to address root cause of the QN.
5. QN material dispositioned as scrap has been rendered unusable.

A V1 QN cannot extend the effectivity of an Engineering Change. If required, submit an SRI to request an amendment to the Engineering Change effectivity date.

The QN application can be found on the Quality Notification link on the Collins Supplier Portal. Individuals requiring QN access must review QN training available on the portal and have their Portal administrator request QN access for them.

Note that V1 QNs do not affect the supplier's scorecard but may be used to assess supplier risk and require corrective action implementation.

### 4.9.4 Collins Initiated Quality Notification (V2 QN)

V2 QN is used to document any potentially nonconforming supplied product identified by Collins. Notification of the issue, and request for Containment and RCCA will be communicated to the supplier via QIM or equivalent.

QIM (Quality Issue Management) is a tool used to track and manage Containment, Root Cause, Corrective Actions and associated objective evidence for potential nonconforming product, based upon industry standard 8D methodology. For potential supplier escapes discovered at Collins or Collins' customer, a QIM will be issued to the supplier. QIMs are emailed to the supplier's Quality Engineer contact. Suppliers are required to notify Collins of any change to the supplier Quality Engineering contact through an SRI and include: name, title, address, phone, and email of new contact.

1. Containment form (COL-FRM-0055) – Due 24 hours from QIM receipt. Complete entire form and submit with initial findings, including objective evidence when applicable. Note: further containment may be required upon part return and findings.
2. SCAR/8D RCCA form (COL-FRM-0054 or approved equivalent) – Due 30 days from part receipt or obtaining sufficient information such as pictures. Complete entire SCAR form, including '5 Why' or other quality tool. For Fault Confirmed, include objective evidence, and complete all the sections for Root Cause and Corrective Action, including Direct, Detect and Systemic Root Cause. For Unconfirmed/Test OK or Customer Induced disposition, fill in the SCAR form and include objective evidence to support the claim.

Note: QIM forms are to be completed electronically. Accepted objective evidence attachment formats include: PDF, Word, PowerPoint, and Excel. Ensure each attachment is named appropriately and highlights the section that is applicable to the corrective action.

### 4.9.5 NOPQE (Notification of Potential Quality Escape)

NOPQE is an escape management process to report potential product non-conformances and non-compliances. COL-ASQR-FRM-0006 is used to document supplier non-conformances and non-compliances found at a supplier's facility concerning product that has shipped.

Supplier shall submit COL-ASQR-FRM-0006 through an SRI within two business days of discovery.

### 4.9.6 Collins Engineering Deviation

A Collins Engineering Deviation may be authorized if, prior to manufacturing of an item, it is necessary to temporarily depart from the mandatory requirements of the configuration documentation (drawing, specification, etc.). A Collins Engineering Deviation or Waiver shall be considered valid for acceptance and delivery of the applicable hardware if the internal work order or purchase order for the manufacture of that hardware was released on or before the expiration date.

Suppliers are responsible for complying with any expirations or limits associated with a Collins Deviation.

## 4.10 DEVELOPMENT PARTS

Development hardware levels will be flowed via the quality notes printed on the PO. The levels are defined in the below table. For required marking, see section 4.11.2.

| Level | Description | Source Inspection | FAI | PPAP | PO Quality Notes |
|---|---|---|---|---|---|
| Engineering Development <TS> | For Engineering development use only. Processed without Quality or Inspection Control. Cannot be upgraded. | Not required | Not required | Not required | Required – exceptions will be listed on the PO |
| Development <R> | Part made to an unreleased drawing. May be upgraded by inspection to released drawing | Not required | Not required | Not required | Required – exceptions will be listed on the PO |
| Upgrades to Production | <R> may be upgraded only when the following requirements are met. (<TS> parts cannot be upgraded) | Required | One full FAI is required for the part being upgraded to production, showing that it was manufactured to the pre-production methods but upgraded to production. In addition, one full FAI is also required, once the first full production lot is run | | Required and Manufacturers Part Number (MPN) is required to be in place, depending upon drawing type (refer to HSM19) |

# 4.11 PART STAMPING/SPECIAL MARKING REQUIREMENTS

A complete tutorial guide for marking parts can be found on the Collins Supplier Portal under Part Identification Generator. It is highly recommended that the supplier receive approval from the Collins Aerospace Part Marking Team (gphspartmarking@collins.com) prior to marking the part.

## 4.11.1 Cage Code 73030

Part marking for drawings with Cage Code 73030 shall include an oval with the last 3 digits of the Supplier Code.

1. Marking may be of the same type as the part marking specified on the drawing or using a stamp.
2. Stamps should be approximately the same size as the part marking and must be legible.
3. Place stamps using permanent ink in contrasting colors to the part identification information.

### 4.11.1.1 General Electric

No stamps are allowed on General Electric part numbers.

### 4.11.1.2 Oval Marking Locations

Place oval marking to the left of the part number except as noted below:

| Situation | Location of Oval Marking |
|---|---|
| Insufficient space | Above or below Collins Part Number |
| No Collins Part Number on part | Container & associated paperwork |
| Part size too small | Container & associated paperwork |
| Bulk Packaging | Obtain approval from Collins via SRI |

## 4.11.2 Special Marking Requirements

Special Marking Requirements for Collins Parts:

| Part Status | Required Acceptance Stamp |
|---|---|
| Parts which passed Pressure Test specifically called out on the Collins drawing | Supplier shall mark letters “PT” in permanent ink or in accordance with approved drawing technique<br>Locate near part number but slightly separate from it |
| Development <R> (Identified with “X” in part number) | Mark “Diamond R” at left side of part number |
| Engineering Development <TS> | Mark “Diamond TS” at left side of part number |

| Part Status | Required Acceptance Stamp | | |
|---|---|---|---|
| NDT Stamping | Stamp to the right (above or below if space restrictions) of applied part number or alternately next to any serial number or on a prominent surface | | |
| Instructions call for identifying NDT acceptance by dye marking | Method | Pieces Inspected | Pieces Not Inspected In Sample |
| | Penetrant | Maroon | Yellow |
| | MPI | Blue | Orange |
| | Radiography | Blue | Orange |

## 4.12 APPLICABLE DOCUMENT REVISIONS

The supplier shall have a process to periodically check that they are working to the latest revisions associated with all levels of the BOM, including embedded specifications, and specifications flowed on the Collins PO.

Where the Collins Drawing refers to a material, process, or inspection specification, drawing or standard that has been revised, cancelled, or superseded, the following shall apply:

- If the Drawing refers to a specific issue or revision of the document, that issue or revision shall be used.
- If the Drawing does not refer to a specific issue or revision of a document, the following shall apply:
    - Standard Parts. For standard parts (such as AN, NAS, MS, M, etc.) the part to be used may be any revision in effect prior to cancellation or supersession. When utilizing MIL-STD parts a change from MIL-X to MIL-DTL or MIL-PRF is considered a change in the revision letter of the document not a new specification.
    - Material, Inspection, Process and Acceptance Specifications
        - Where the document is cancelled, with or without supersession, the last issue prior to cancellation or supersession shall continue to be applicable.

For superseded Collins Specifications or if the above cannot be met, an SRI shall be submitted for direction. Reference HSM19 for Approved Alternates (69100, PN02.01-06).

## 4.13 APPROVED SPECIAL PROCESSES

All process and material specifications that appear on any Collins engineering drawing, and are also listed on Reports 80 & 85, require a Collins approved source. Suppliers shall use a Collins approved supplier (except as noted in Table 1) when a specific material or manufacturing special process is listed in Collins Report #80, "*Collins Approved Process/Material Supplier Report*," or be listed as a Collins approved supplier in Collins

Report #85, "*Supplier Internal Processes Report*." Exceptions to Collins STD Parts, COTS and Standard catalog hardware are those noted in Appendix 1 and 2.

**Report #80**

Identifies Collins approved suppliers who are capable of providing a special manufacturing process or material in accordance with applicable process/material specifications (e.g., HS, PN, CP, AMS, MIL STDs, etc.), typically as a service provider.

**Report #85**

Identifies Collins approved suppliers/fabricators who utilize their own captive internal special manufacturing process or material in accordance with applicable process/material specifications (e.g., HS, PN, CP, AMS, MIL STDs, etc.), typically in the production of Collins product.

**Note:** Reports #80 and #85 are available on the Collins Supplier Portal.

The Supplier cannot ship product unless the Special Process Supplier is on the 80/85 Report and appears in the iLot drop down. If a specification is listed in either Collins Report #80 or #85, and no Collins approved process supplier is listed, then the supplier shall submit a help desk ticket through the Collins Supplier Portal. If the Supplier is requesting a new supplier be added to the Report 80/85, then they can submit an SRI.

The below iLot drop down choices are only to be used as defined below:

1. AS PROCURED:

   Material procured in the blueprint heat treated condition. The heat treat specifications will have the "AS PROCURED" option added to the iLot drop down menu. Select this option when the material you have procured was procured in the blueprint heat treated condition (by the mill or an 80/85 approved source).

2. ALTERNATE METHOD OF MANUFACTURE:

   Various special process specifications will have "ALTERNATE METHOD OF MFG (V)" option added to the iLot drop down menu. This option is for the process not being used when the blueprint identifies two or more special processes being allowed. This is NOT to be used for any other situation.

3. DQR VERIFIED:

   Various special process and material specifications will have "DQR Verified" as an iLot dropdown option or listed on the 80/85 report. By selecting DQR VERIFIED on the iLot, the DQR is signifying that they have verified compliance per the specification requirements and the iLot MIC long text.

- For special processes, the supplier may not be restricted; however, the DQR is required to verify compliance per the specification requirements. For example, PN15.12 requires the DQR to verify that the correct primers / topcoats were utilized.

- For materials, approved sources may be required per the specification, as well as additional verifications. For example, MS22.01-01 requires the DQR to verify manufacturing by the approved source listed in the specification or associated addendum (ADD).

4. HS FURNISHED:

   Hamilton Sundstrand/Collins furnished material. There are times when HS/Collins furnishes material. When this occurs and the material has already gone through the various special processes identified on the blueprint, select "HS FURNISHED" option from the iLot drop down menu.

**Table 1: Special Process Requirements**

| Drawing Type | Examples | Applicable Collins Site | Collins Special Process Specs | MIL/Fed/Ind Special Process |
|---|---|---|---|---|
| **Released Production Drawings** | | | | |
| Collins Design<br>Source Approval Item<br>Altered Item Drawing | 17044534, 903D421, 4506783, C1006748 | All | 80/85 supplier required | 80/85 supplier required |
| Specification Control<br>Vendor Item Control Drawing<br>Selected Item Drawing<br>Collins Std Parts Drawing<br>COTS | 17044534, 903D421, 4506783<br><br><br>69234, 69240, 69603, 3415 AN, MS, NAS, JN, JANTX, JANHC | All | 80/85 supplier required | 80/85 supplier **not** required |
| Source Control (Design Responsible) | 5018794, 5900100, 5913596 | All | 80/85 supplier required | 80/85 supplier **not** required |
| **Advanced Release Drawings** | | | | |
| Advance Release Drawing | 170XXXX rel 01 ARC 11 | RFD | 80/85 supplier required | 80/85 supplier required |
| Advance Release X Drawing | 579X2-81577-1 (Diamond R Material) | WLOX | 80/85 supplier required | 80/85 supplier required |
| Advance Release HSPS | 450XXXX IAR 8 | HSPS | 80/85 supplier required | 80/85 supplier required |
| **Non-production Drawings** | | | | |
| EP – Non-Production | EP 1705968 | RFD | 80/85 supplier **not** required | 80/85 supplier **not** required |
| Diamond TS- Non-Production | 579X2-821577-1 W/Diamond TS Purchase Order Note | WLOX | 80/85 supplier **not** required | 80/85 supplier **not** required |

## 4.14 NADCAP ACCREDITATION REQUIREMENTS

As a prerequisite for obtaining Collins approval on Report 80 & 85, Nadcap accreditation is required for the following special processes: materials testing, chemical processing, coatings, heat treating/brazing, nondestructive testing, nonconventional machining, surface enhancement, welding/brazing, and electronics.

Design Responsible suppliers should be Nadcap accredited or use Nadcap accredited sources for special processes.

## 4.15 ELECTRONICS REQUIREMENTS

### 4.15.1 IPC Certification

For electronics manufacturers of Printed Wiring Boards, Circuit Card Assemblies, and Cable and Harness Assemblies, inspectors and hand assembly/solder operators shall have the applicable IPC certification. Valid IPC certificates are required as noted:

1. Printed Wiring Boards – IPC-A-600 (all inspectors, including those validating micro-sections).
2. Circuit Card Assemblies – IPC-A-610 and/or J-STD-001 (all inspectors, hand solder and hand assembly personnel).
3. Cable and Harness Assemblies – IPC/WHMA-A-620 (modules applicable to scope of work) and J-STD-001, if any soldering is noted on the part drawing.

### 4.15.2 Visual Acuity

Operators and inspectors involved with electronics manufacturing are to be tested annually by a medical professional and must meet one of the following near vision standards.

1. Tumbling E in accordance with ISO 18490
2. 20/25 (Snellen) at 16 inches (40.64cm), +/- 1 inch (2.54cm)*
3. Jaeger No 1 at not less than 12 inches (30.48cm)*

* With at least one eye, either natural or corrected

Color vision requirements: Operators and inspectors must be able to distinguish and differentiate between red, green, blue, and yellow at a minimum as prescribed in Dvorine Charts, Ishihara Plates, or AO – HRR Tests.

## 4.16 DIGITAL PRODUCT DEFINITION (DPD)

Suppliers shall have a process for management of Digital Product Definition (DPD) that effectively controls digital media files that are used to create (directly or indirectly) manufactured items. This shall consist of the following at a minimum:

1. Storage / Security: Defined a method to store CAD files including a backup of all CAD files, similar to a 2D blueprint, and make the CAD file only accessible to the correct person(s) at the site.
2. Configuration Management: Established process to control revisions of changes and verify latest revision levels of CAD/CAM/CAI software, Dataset Derivatives, and Inspection Acceptance Software.
3. Dataset Derivatives: Track back to the authority dataset from any manufacturing document, establish what derivative media will be used for product manufacture, and document obsolete Authority Datasets and Derivative Media
4. Product Acceptance: Establish a process to use inspection acceptance software validation and compare intervals of validation to national standards (NIST).
5. Data Exchange: Establish controls required for regularly verifying CAD compatible software requirements; internally and from the customer
6. CAD Translations: Validate translated files. Process non-conformances found by the translated files and notify the customer of any translation errors that are found during manufacturing of product (disclosures)
7. Compliance: Verify compliance to all requirements above via training and internal audits per AS9100
8. For additional information and training, refer to the training presentation on the Supplier Portal. https://suppliers.utc.com/SPPortal/Pages/QualitySSI

## 4.17 HUMAN FACTORS

The supplier's QMS shall include management of human factors in its processes including:

a. Training of employees.
b. An open reporting culture, encouraging the sharing of mistakes without fear of retribution.
c. Considering human factors in investigations.
d. Considering human factors in the reporting of performance and identifying improvement plans.

Human factors shall be an integrated part of product and service design, manufacturing, assembly, and product servicing. For details on the deployment of human factors within the organization, refer to RM13010.

# 5.0 DQR PROGRAM

The Collins DQR program is a process whereby a supplier is delegated the authority to act on behalf of Collins to verify and release product.

The number of DQRs approved for a specific supplier shall be commensurate with the workload and appropriate contingency factors (vacation, holidays, illness, shift coverage, fluctuations in PPM, First Article audits, etc.). It is highly recommended a minimum of two DQRs be available at all times.

For all self-released product, the DQR shall complete an electronic source inspection record (iLot) within the Supplier Portal. After completing the iLot, the supplier is responsible for creating an ASN (Advanced Shipping Notification) within the Supplier Portal, prior to shipping.
**Note:** iLots are acceptable substitutes for Certificates of Conformance.

## 5.1 THIRD-PARTY OR COLLINS SOURCE INSPECTION

Suppliers shall request third-party source inspection services per instructions located on the Collins Supplier Portal when:

1. Supplier does not have approved DQRs.
2. Supplier does not have adequate DQR coverage.
3. Collins has implemented DQR Restrictions per section 5.4.

Third-party source inspection services shall be at the supplier's expense. Once the iLot is created, the supplier is responsible for creating the ASN in the Supplier Portal prior to shipping.

For all First Article Releases for Flight Safety Product, Full and Partial (Delta):

1. The FAI shall be approved by a SQAR or delegate.
2. Source Inspection shall be completed by the SQAR or delegate.
3. Subsequent releases of Flight Safety Product can be performed by the DQR.



## 5.2 SUPPLIER REQUIREMENTS

To be approved for the DQR Program, the supplier shall:

1. Be listed on the current Collins Power & Controls Quality Approved Supplier List
2. Select qualified employees from the quality department considered competent to perform the required duties of a DQR.
3. Submit ASQR-01 Form 8 (DQR Letter of Agreement) to the Collins SQAR and DQRCertification@collins.com.
   a. A new Form 8 should be submitted every 3 years or when there is a change in the Supplier's Quality Manager.

The supplier shall notify the Collins SQAR and DQRCertification@collins.com when a DQR is leaving their position.

## 5.3 OVER-INSPECTION

Over-Inspection requires two DQRs to release parts. The first DQR will complete a M-code iLot. The M-code iLot may be completed by a probationary or production DQR. A second DQR of production status is required to complete the over-inspection and create the F-code iLot. If a second DQR is not available, the supplier shall contact third-party source inspection services (reference section 5.1).

Over-Inspection is required when:

1. First Article Inspection Report Review (AFAI iLot) - AFAI iLots are triggered by the system when a FAI is required to be validated. The system calculates this based on part number, part revision, vendor code, Collins plant code (where parts are shipping), and 2-year lapse in shipment. When any of these change, a AFAI iLot is required. If a valid FAI is already on file, this can be used, and the over-inspection can be performed by a 2nd DQR to complete the shipment.
2. A DQR is on probation.
3. Implemented by Collins Supplier Quality Management (reference 5.4)

## 5.4 DQR RESTRICTIONS

DQR Restrictions, including Double DQR or Third-Party Over-Inspection, may be implemented at the discretion of Collins Supplier Quality Management.

Implementation of Double DQR or Third-Party Over-Inspection may take place when any of the following occur:

1. Actions taken by the supplier have been determined detrimental to the best interest of Collins.
2. Supplier PPM >250
3. Significant or repeat escape to Collins or to a Collins customer.
4. Major audit finding (Collins or Industry audit)
5. Loss of QMS Certification

Note: Collins reserves the right to move directly to Third-Party Over-Inspection in lieu of Double DQR Over-Inspection. Third-Party Over-Inspection shall be funded by the supplier.

Criteria for removal of DQR Restrictions may include:

1. Zero Defects (sustained for three months)
2. Closure of audit findings
3. No Third-Party findings during Over-Inspection (sustained for three months)

**Note:** Collins reserves the right to impose chargebacks for non-compliant FAIs and escapes (QNs). These chargebacks, however, do not preclude, nor in any way limit Collins from collecting additional damages resulting from these Escapes and recovering additional costs which Collins may incur from such Escapes. Collins reserves the right to override any provision of the escalation policy.

## 5.5 DQR PROCESS: BECOMING A DQR

A Delegated Quality Representative (DQR) is a supplier representative (employee) approved by Collins to perform Source Inspection and related duties. When a DQR is performing source inspection, they are doing so on behalf of Collins and shall act in the best interest of Collins.

### 5.5.1 DQR Candidate Selection

Minimum qualifications for candidates are:

1. Employee of the supplier
2. Directly report through the Quality Organization
3. Annual verification of visual acuity and color vision by certified eye professional (e.g., optometrist, certified company nurse). The following eye exam requirements apply, and objective evidence shall be kept on file at the supplier. Persons performing visual inspection (i.e., calibration, non-weld, in-process, layout, and dimensional inspectors) shall be compliant with the requirements of Snellen 14/18, (20/30), Jaeger2, or equivalent as determined by a certified eye professional.
4. A minimum of (6) six months experience with Collins product, specifications, and drawing requirements.
5. A minimum of (1) one year experience in the inspection field or Quality environment.
6. Have access to the Collins Supplier Portal (suppliers.utc.com)
7. The ability to read, write and understand English.

**Note:** These requirements can be tailored by Collins SQAR depending on the experience of the potential DQR candidate, and/or commodity being supplied.

### 5.5.2 DQR Candidate Submittal

The below must be completed for each candidate and submitted to Collins Supplier Quality (SQAR or DQRCertification@collins.com). All forms and documents relative to the DQR Process must be in English.

1. AS13001 Certification
2. Collins specific DQR Training Webinar and DQR Training Modules Test (available on the Supplier Portal)
3. ASQR-01 Form 7, DQR Candidate Form
4. ASQR-01 Form 8, Letter of Agreement (LOA) (if this was previously completed and still valid, provide a copy of this for evidence)

### 5.5.3 DQR Candidate Approval

The Collins SQAR will:

1. Be the primary contact for any DQR questions or issues
2. Review the submitted documentation (reference 5.5.2)
3. Conduct an interview with the DQR Candidate
   a. The SQAR will ensure the candidate has knowledge of Collins Supplier Portal, flow down requirements, purchase orders, engineering drawings, specifications, special process approvals (Report 80/85) and how to release an iLot.
4. Determine the candidate's approval for Production or Probationary access. Full Production DQRs will be able to create F-coded inspection lots which allow the product to be shipped. Probationary DQRs will only be able to create M-coded inspection lots (see Section 5.5.4).

Collins Supplier Quality reserves the right to deny a DQR applicant.

Upon approval, the DQR Candidate shall receive an approval email and be granted access to the Electronic Release application on the Collins Supplier Portal (Source Inspection). Additionally, DQRs are required to have access to:

- Control of Process and Safety (COPs), or equivalent
- PLM Engineering Information
- Quality Notifications (QNs)
- Supplier Request for Information (SRI)

If a DQR is missing any required access, they are to work with their Supplier Portal Admin to gain access. Some access may be restricted and require Collins approval.

Note: Non-US DQRs may have limited access to these functions.

### 5.5.4 Probationary DQR Process

Upon Collins discretion, a DQR may be set up as a Probationary DQR. Probationary DQRs are only authorized to generate M-code Releases during their Probationary period. All M-code Releases shall have Over-Inspection verification performed and shipped with an F-code Release. Reference section 5.3.

Over-Inspection verification can only be performed by one of the following:

- Non-probationary DQR at the site
- Collins SQAR
- Third Party Source Inspector (CQAR)

DQR status may be upgraded or removed at the discretion of Collins.

### 5.5.5 DQR Recertification Process

Recertification is required every 3 years. Failure to comply with the below recertification requirements will result in the loss of DQR status and SSI access. The DQR recertification date will be based on the AS13001 certification expiration date.

Recertification requirements:

1. Current AS13001 certification
2. Retake of the Collins specific DQR Training Webinar and DQR Training Modules Test (available on the Supplier Portal)
3. Updated ASQR-01 Form 7 and Form 8, if requested

### 5.5.6 DQR Suspension

At the discretion of Collins Supplier Quality, a DQR or supplier may be suspended from the DQR program at any time.

Suspension from the DQR Program may take place when any of the following occur:

1. Collins determines DQR coverage is no longer required.
2. Actions taken by the DQR are detrimental to the best interest of Collins.
3. Significant escape to Collins or the OEM customer released by the DQR.
4. If there are Repeat Escapes
5. It is determined that Electronic Release identifications and passwords are shared with other employees.
6. No DQR activity occurring in a 12-month period.
7. Email failure – DQR email address and Electronic Release user I.D. must be the same.

Suspended DQRs may be reactivated if the requirements below are met. DQR may be set up as a probationary DQR and may require SQAR evaluation and training.

1. DQR demonstrates improved performance and compliance to HSM17.
2. A DQR who has not created a release in a 12 Month period will have to retake the DQR test.
3. If the DQR had previously lost access to the Collins Portal, access must be restored.

Collins SQAR is responsible to ensure the DQR is adequately trained prior to reactivation.

## 5.6 DQR RESPONSIBILITIES

### 5.6.1 Access

1. The DQR's Supplier Portal account must have access to portal links specified in paragraph 5.5.3.
2. DQRs are required to be able to navigate throughout the Supplier Portal to access the following:
   - Source Inspection (SSI & iLots)
   - Latest Drawings and Specifications
   - Purchase Orders and PO note codes
   - SRIs
   - V1 and V2 Quality Notifications (QN)
   - Collins Supplier Quality Forms and Documents (Supplier Portal > Help & Training > Forms & Documents)
   - Report 80/85
   - Supplier Circulars
   - COPS or equivalent (as applicable)
   - ETQ Reliance for PPAP (as applicable)
3. DQRs are required to review all quality alerts and Supplier Circulars (from Collins or supplier) to verify if product is impacted.
4. DQRs are approved based on location and Vendor Code. DQRs shall not ship product from a location or Vendor Code that they are not approved for.

### 5.6.2 DQR General Review

DQRs are responsible for the following reviews.

1. Review the full purchase order and supplements for all quality requirements, PO Note Codes, and any additional embedded requirements.

**Note**: Any requirements stated in a purchase order requiring compliance to MIL-Q9859, MIL-I-45208, MIL-STD-45662, MIL-STD-1535, MIL-STD-1520, and/or HSM 1 & 2 are superseded by the requirements flowed in the global quality requirements (i.e., COL-ASQR-PRO-0003, HSM17, HSM19 and HSM236).

2. Compare the part revision on the purchase order against the part revision shown in PLM Engineering Information on the Portal. If they do not match, verify the reason why. Review Engineering Changes and Effectivity Codes and Dates to determine if there is a mandatory change. Work with Collins procurement, as needed.

   a. The revision of the physical parts shipping shall match the revision on the Collins PO.

   b. On the PO, the (DWG rev or DIR) is the part revision and the (Issue) is the drawing revision. The Issue revision may not be listed on the PO.

3. Review the Bill of Material (BOM) including the revisions and embedded specifications, as required (available on the Supplier Portal).

4. Validate the use of Approved Suppliers (MPN – Manufacturing Part Number) and Distributors (QDL – Qualified Distributor List).

5. DQRs are to be aware of applicable SRIs.

   a. Parts affected by a work transition shall not ship until Collins approval of ASQR-01 Form 4 is granted through the SRI.

6. Verify the manufacturing/inspection traveler to ensure all operations were completed and accepted in accordance with the applicable purchase order, all drawings, and all specification requirements. Validate all parts are accounted for throughout manufacturing and to the current revision. If lots were split, ensure that all operations have been completed.

7. Review drawing and purchase order for non-flight safety Critical to Quality Characteristics (CTQC) or Key Product Characteristic (KPC1 and KPC2) requirements. DQRs shall validate in the COPS database that required data has been collected and recorded. See section 5.6.4 for Flight Safety requirements.

8. Verify Special Process are performed in accordance with Section 4.13. Verify all certifications have correct specifications, revision, type, class, signatures, dates, etc.

9. Verify compliance to HSM19 regarding Raw Materials and Unbroken Traceability.
    a. Validate the Chemical / Raw material certifications reflect actual values (not range), including mill data, and that the material certifications match the drawing and specification requirements.
    b. Validate unbroken chain of ownership from the mill to the purchase order supplier (i.e., packing slips/ CoCs from each intermediary distributor)
    c. If required, verify material verification testing results are provided and within engineering and specification tolerance.
    d. If required, validate compliance to DFAR 252.225-7009 & 252.225-7012.
10. As applicable, verify the functional tests (i.e., Acceptance Test Procedure, ATP, Final Acceptance Tests) are approved and revision controlled. Verify data sheets and inspection operations are complete and acceptable (within engineering tolerance). Verify variable results are recorded when applicable. Test data sheets shall include the following minimum requirements:
    a. Test specification number, revision status, amendment number and addendum.
    b. Part number, serial number, and revision letter of product being tested.
    c. Test paragraph required reading/actual reading (use positive statement, e.g., "No Leakage" if actual reading is not quantifiable).
    d. Date test was performed.
    e. Operator identification (Inspection approval signature / stamp).
    f. Blank entries that are not applicable shall be noted "N/A".
    g. As applicable, all testing equipment is properly listed and accounted for.
11. Verify all documentation and all signatures are clear and identifiable.
12. If ASQR-09.2 is invoked by the PO, then the DQR shall validate that the PPAP Form 1 has Collins approval (Full, Interim or Deferral). Reference section 4.8.
    a. For Interim approvals and Deferrals, the DQR shall validate the date is current.

### 5.6.3 DQR Inspection

1. DQRs shall have physical possession of parts when completing the iLot. Remote inspection is not allowed.
2. DQRs shall have a copy of the Collins' drawing and Purchase Order when completing the iLot.

3. DQR shall perform an independent, over-inspection on a minimum of 3 pieces and 5 characteristics (unless lot size or characteristics are less) for all Master Lots or individual releases.
    a. The inspection results (3 Pieces and 5 Characteristics Min) shall be recorded in the Quality Notes of the iLot or attached to the iLot.
    b. The selected characteristics shall vary for each lot and DQR, ensuring any tight tolerances are selected.
    c. The DQR shall verify all Statistical Process Control (SPC) features are properly accounted for during manufacturing and in-process inspection and that SPC data has been collected and recorded in COPS per HSC16199.
    d. Note: In the event the supplier is performing SPC, do not choose a characteristic that has a CPK greater than 1.33.
4. The DQR shall inspect the entire manufactured lot presented and verify that 100% visual and 100%-part marking has been completed.
5. For applicable 2D marking, verify the marking has been:
    a. Validated – Confirm that the data content contained in the 2D Data Matrix Symbol is accurate and conforms to the DOD Construct format as well as ISO15434 and ISO15418.
    b. Verified – Confirm that the printed symbol meets the quality guidelines as specified by MIL-STD-130.
6. Verify the First Article Inspection Report (FAIR) is properly completed per AS9102, HSM236 and the PO.
    a. Verify the FAIR is properly signed and dated by the preparer and approver.
    b. When the PO requires Collins approval, validate that the FAI was approved by Collins. Validate all new FAIs (starting in 2023) have been submitted through Net Inspect.

        Note: DQRs do not have customer signature authority. DQRs are not authorized to ship product prior to Collins approval of the FAIR, when required by the PO.
    c. For AFAI iLots, the DQR shall attach a copy of the FAI Form 1 to the iLot.
    d. For all iLots, the approval date of the FAI shall be added to the quality notes.
7. If sample inspection is utilized, verify sample plans meet all requirements of section 4.6.

### 5.6.4 Flight Safety Hardware

1. All approved DQRs need to have access to the COPS database or equivalent when HSC16199 or Statistical Process Control (SPC) has been flowed down on the drawing or purchase order.

   Note: Non-US DQRs may have limited access to these functions and shall work with Collins on the process for validation of compliance to COPS requirements.

2. The DQR shall review the drawing and purchase order for flight safety requirements per HSC16199 and verify all Flight Safety characteristics and Flight Safety features have been inspected 100% and variable data has been recorded.

3. DQRs shall validate in the COPS database that:

   a. For Class 1 Parts:

      - Identified frozen processes for Flight Safety Characteristics (FSCs) have been approved by Collins and parts were produced to the approved revisions.
      - For KPC1s, SPC data is to be recorded 100% within the COPS database (or equivalent).

   b. For Class 3 Parts:

      - Identified frozen processes for Critical to Safety Characteristics (CTSC) have been approved by Collins and parts were produced to the approved revisions.
      - Current HSF-5138 have been approved by Collins.
      - SPC Records for self-selected KPCs are being maintained and are available if requested.

4. Initial Release and subsequent Partial (Delta) FAIRs can only be performed by an SQAR or CQAR. Subsequent releases not involving FAIRs may be performed by a DQR.



### 5.6.5 Critical to Quality Hardware

1. All approved DQRs need to have access to the COPS database when HSC16199 or Statistical Process Control (SPC) has been flowed down on the drawing or purchase order.

2. DQRs shall validate in the COPS database that:
   a. For Class 1 Parts
      - Identified frozen processes for Critical to Quality Process (CTQP) have been approved by Collins and parts were produced to the approved revisions.
      - For KPC2s, SPC data is to be 100% recorded into the COPS database (or equivalent). Suppliers may move to a sampling plan, per ASQR-20.1, once the requirements of HSC16199 section 4.1 or 4.2 are met and KPC is statistically capable (minimum Cpk = 1.33).
   b. For Class 3 Parts
      - Current HSF-5138 for Critical to Quality Characteristics (CTQC) have been approved by Collins.
      - SPC Records for self-selected KPCs are being maintained and are available if requested.

### 5.6.6 Non-conformances

1. DQRs shall be aware of the part's quality history to ensure nonconforming product is not shipped. Rejection history for a particular part can be viewed in the quality notes tab in the iLot for that part.
   a. For product with QN history, DQR shall verify 100% inspection for any deviated characteristics for a minimum of the next (3) three consecutive manufactured lots.
2. DQRs shall review any QNs and any returned hardware to ensure that the dispositions are fully completed and inspected as applicable.
3. iLot generated for affected product shall accurately document QN activity in the quality notes of the iLot. Best practice is to provide a hard copy of the QN and disposition with the physical parts.
4. For product being shipped with a dispositioned QN, the DQR shall ensure the shipment does not exceed the approved QN quantities.
5. DQR shall ensure all parts are accounted for within the traveler (scrap, rework, repair).
6. DQRs shall ensure that parts associated with an open QN are not shipped. Reference section 4.9.3.

### 5.6.7 Product Release

1. Perform all production product releases through the iLot system, assuring completion of all associated documentation, inspections, and tests in accordance with Collins procedures and specifications.
   a. Master iLots may be created for the entire manufacturing lot. Individual shipments can be made by creating an ASN label. Each shipment will result in a down count on the Master iLot.
   b. If a required specification is missing from the iLot Inspection Plan, the supplier shall submit a help desk ticket through the Supplier Portal.
2. The DQR completing the iLot shall not be the same associate who performed the Final Inspection (ASQR-20.1 inspection).
3. Electronically attach the following documents to the iLot:
   a. Material certs, Special Process certs, etc., as directed by Collins (it is preferred to have certifications attached for every iLot)
   b. ATP results shall be attached to the iLot, as applicable
   c. AS9102 Form 1 for First Article Lots (AFAI)
   d. Applicable Traceability (serial numbers, lot date codes, work order or shop order number). As an alternate, this information can also be entered directly into the iLot Quality Notes.
   e. Dimensional Inspections per section 5.6.3 (3 Pieces and 5 Characteristics Min). As an alternate, this information can also be entered directly into the iLot Quality Notes.
4. Allowance of a risk release, SSI/iLot by-pass, or partial SSI/iLot acceptance may only occur when granted authority by Collins Supplier Quality Manager. In the event of this occurrence, specific instructions will be provided as applicable with the authorization to ensure proper receipt and containment at Collins for required follow-on actions. DQR shall reference authorization within the quality notes of the iLot when generated. Product will be contained at Collins until full compliance can be established.

### 5.6.8 Special PO Types

For special PO types such as ZTOP, suppliers shall complete COL-FRM-0034 in place of creating an iLot when HSM17 is called out on the PO. A copy of the COL-FRM-0034 shall be included with the physical parts. ZTOP orders are utilized for offloads and processing of customer returned material.

# Appendix 1: Commodity Requirements

## O-Rings:

All O-rings supplied to Collins must be individually packaged with the appropriate part marking on each bag. Bulk packaging is not allowed. Bag type must be in accordance with AMS2817 Type 3.

Industry Standard O-Rings:

Industry Standard O-rings must be made by a Collins approved manufacturing site for the material formulation of the O-ring. The approved manufacturing sites are listed in Collins Report #80 under the material formulation. Collins drawings listing Industry Standard O-rings with approved sources are excluded from this requirement.

## Teflon Wire:

M22759/5, M22759/7, M22759/9, M22759/11 and MIL-DTL-16878 PTFE Teflon Wire must be Differential Scanning Calorimetry (DSC) tested per the requirements of Engineering Standard MS41.14 paragraph 3.0.

DSC testing is not required on the following product applications:

- Wire Harnesses
- Cable Assemblies
- Switches
- Cable and Connectors
- Venturi Heaters
- Sensors

If there are any doubts on the application and applicability of this requirement an SRI shall be submitted to gain Collins Aerospace concurrence.

# Appendix 2: High Strength Fastener (HSF)
# Externally Threaded HSF Requirements

Fastener Manufacturers producing externally threaded fasteners with a minimum ultimate tensile strength of 150,000 pounds per square inch or greater shall be AS9100 certified, and Collins approved. This includes high strength fasteners produced to Collins drawings, military, federal and industrial specifications. Approved manufacturers are listed in Collins Report 80 under *"Fastener Manufacturers, High Strength"*. Fasteners manufactured by sources that are not Collins approved will not be accepted.

All special processes and non-destructive testing performed per Collins, military, federal and industrial specifications shall be performed by Collins approved suppliers (Collins Report 80/85) or Nadcap accredited sources per section 4.13, Table 1.

If the special process supplier is not Collins or Nadcap approved, verification testing is required as specified herein. **Note:** Verification testing is not allowed on Collins Flight Safety Parts and Cage Code 73030 designed standard parts.

The following Table 2 sampling plan shall be used when verification testing is performed on HSFs.

**Table 2: HSFs Sampling Plan**

| Lot Size **From** | Lot Size **To** | Sample Size – Nondestructive Test 1.5 AQL (1.9 AOQL) (b) | Sample Size – Destructive Test (a) 1.5 AQL (1.9 AOQL) |
|---|---|---|---|
| 2 | 8 | 8 | 4 |
| 9 | 15 | 8 | 4 |
| 16 | 25 | 8 | 4 |
| 26 | 50 | 8 | 4 |
| 51 | 90 | 8 | 4 |
| 91 | 150 | 12 | 4 |
| 151 | 280 | 19 | 4 |
| 281 | 500 | 21 | 4 |
| 501 | 1,200 | 27 | 4 |
| 1,201 | 3,200 | 36 | 4 |
| 3,201 | 10,000 | 38 | 4 |
| 10,001 | 35,000 | 46 | 4 |
| 35,001 | 150,000 | 56 | 4 |
| 150,001 | 500,000 | 64 | 4 |
| 500,001 | greater | 64 | 4 |

(a) The Destructive Samples may be taken from the Nondestructive sample after they have finished their nondestructive verification testing.
(b) Table 2 Sampling is not permitted for Magnetic Particle (MPI) or Fluorescent Penetrant (FPI) Inspection.

**Table 3: Verification Testing Requirements on HSFs**

**Verification Testing of Required Special Processes by Suppliers Without Collins or Nadcap Approvals**

| Special Process (c) | Fastener's Specifications (d) | Required |
|---|---|---|
| Certification Review (Traceability) | Dependent on HSF is Required for all restricted special processes | Yes |
| Verification Test Report, when required | Examples of Fastener's Specifications Requirements | Yes |
| Heat Treat - Core Hardness<br>**OR**<br>Ultimate Tensile Strength | ASTM E384<br><br>ASTM F606 | Yes |
| Heat Treat - Carburization | ASTM F2328 | Yes |
| Decarburization Thread Hardness | ASTM F835 | Yes |
| Plating -- Thickness | NASM1312-12, ASTM B487 | Yes |
| Plating -- Hydrogen Embrittlement Test (HET) (a) | ASTM F606 – Mandatory Test Method | Yes |
| Plating -- Corrosion Resistance | Specific Part Plating Specification | No |
| Passivation (b) | AMS2700 - Humidity Test | Yes |
| Thread Form | Specific Part Procurement Specification | Yes |
| NDT –MPI (e) | ASTM E1444 | Yes |
| NDT –FPI (e) | ASTM E1417 | Yes |

(a) HET per ASTM F606 is mandatory if no HET specification appears on a plated HSF document or its tiers.

(b) Verification testing is to be performed per the passivation specification noted on the fastener's documentation.

(c) These verification tests are only required on processes that were not performed by Collins Approved or Nadcap accredited sources.

(d) The specs referenced in the Table are intended to be examples and not a comprehensive list. The applicable fastener specification or drawing shows the required testing documents.

(e) NDT inspections, including frequency shall be performed in accordance with the requirements specified for the fastener (drawing and procurement specification).

If Table 3 does not address a required restricted special process (e.g., dry film lube, peening etc.) the Supplier shall submit an SRI to Collins for verification testing requirements.

All verification testing defined in Table 3 shall be performed at a laboratory accredited by either Nadcap or signatories to the International Laboratory Accreditation Cooperation (ILAC). Accreditation shall cover the scope of testing performed.

HSFs must pass all the required verification testing to be used on Collins product.

Verification testing failures need full lab reports including photographs to document the reason for failure. Collins shall be notified in writing of any test failures.

When verification testing is performed, the supplier furnishing the HSF to Collins either as a detail or part of an assembly is responsible for maintaining traceability to the original HSF manufacturer, part number and manufacturing lot.

Upon request electronic or hard copies of verification testing results shall be sent to the user of the HSF.

When verification testing is required, the instructions for completing the electronic source inspection record (iLot) are specified in the Materials and Processes Review section under “Fastener Manufacturers, High Strength”.

# Appendix 3: What is a Change

Any change that may affect quality must be communicated to and approved by Collins via SRI prior to effectivity of the change. The below table is meant to provide guidance for the common types of changes that drive the need to create a FAI or require Collins notification. If unsure, submit an SRI for Collins direction.

**If Flight Safety, Frozen Process or PPAP applies, the supplier shall abide by HSC16199, ASQR-09.2 or applicable specification, in addition to the below guidance.**

| **Item** | **Type of Change** | **Is Collins Approval Required?** | **If approval is required, submit the below form through an SRI** | **Is a full or partial FAI required?** Determination of full or partial FAI is dependent on what characteristics were effected by the change. |
|---|---|---|---|---|
| 1 | Ownership (Mergers/Acquisitions) | Yes | COL-ASQR-FRM-0002 | No |
| 2 | Company Name | Yes | COL-ASQR-FRM-0002 | No |
| 3 | Manager or Leadership impacting Collins (i.e., Quality Manager); or a change in the number of employees or resources (≥10% change within 3 months) used to provide Collins Aerospace products or materials | Yes | COL-ASQR-FRM-0002 | No |
| 4 | Loss or suspension of QMS Certification (AS9100, AS9120, ISO9001, Nadcap) | Yes | COL-ASQR-FRM-0002 | No |
| 5 | A natural or man-made event, which may adversely affect the manufacturing process (i.e., Fire) | Yes | COL-ASQR-FRM-0002 | Yes |
| 6 | Type of gage to inspect feature | No, unless the 4:1 accuracy ratio is not met | COL-ASQR-FRM-0002 | No, if the Gage R&R Capability meets <20% of total tolerance |

| Item | Type of Change | Is Collins Approval Required? | If approval is required, submit the below form through an SRI | Is a full or partial FAI required? Determination of full or partial FAI is dependent on what characteristics were effected by the change. |
|---|---|---|---|---|
| 7 | Inspection frequency | No, if requirements of ASQR-20.1 or AS9138 have been met.<br>Yes, if requesting approval of an alternate sampling plan. | SRI (no additional form required) | No |
| 8 | Type of tool or equipment to create feature | Yes | COL-ASQR-FRM-0002 | Yes |
| 9 | Change / Modify / New fixture used to produce part | Yes | COL-ASQR-FRM-0002 | Yes |
| 10 | Change or move machining center | Yes | COL-ASQR-FRM-0002 – if in the same campus<br>ASQR-01 Form 4 – if moving to a new address | Yes |
| 11 | Manufacturing sequence: addition or removal of operations of an existing process | Yes, if process step affects fit, form, or function. | COL-ASQR-FRM-0002 | Yes, if process step affects fit, form, or function (e.g., casting, forming, molding, machining, plating, coating, heat treating, marking, etc.).<br><br>No, if process step doesn't affect fit, form, or function (e.g., inspection, data collection, etc.). |
| 12 | Special Process Supplier | Yes, if requesting a new source to be approved on Report 80/85.<br><br>No, if the source is already approved on Report 80/85. | COL-ASQR-FRM-0002 | Yes |

| Item | Type of Change | Is Collins Approval Required? | If approval is required, submit the below form through an SRI | Is a full or partial FAI required? Determination of full or partial FAI is dependent on what characteristics were effected by the change. |
|---|---|---|---|---|
| 13 | Digital model used to produce or inspect the part | Yes, if digital model is being used as the authority data set for the configuration of the part.<br>No, if digital model is only used as a manufacturing aid. | n/a | Yes, if digital model is being used as the authority data set for the configuration of the part.<br>No, if digital model is only used as a manufacturing aid. |
| 14 | Outsource work to sub-tier supplier (complete or partial offloads) or Insourcing (bringing work in house) | Yes | If the move is for rough machining that does not affect design characteristics, then use COL-ASQR-FRM-0002. If not, use ASQR-01 Form 4 | Yes |
| 15 | New Manufacturing Location (Collins supplier or sub-tier, including casting and forging suppliers) | Yes | ASQR-01 Form 4 | Yes |
| 16 | Casting and forging tools – if a new tool is produced or if an existing tool is moved to a new facility | Yes | COL-ASQR-FRM-0002 | Yes. FAI is required by the casting / forging supplier. A partial FAI to validate dimensional characteristics is required by the machining supplier. Refer to HSM236. |
| 17 | Raw material distributor change | No, if using a distributor on the QDL | ASQR-01 Form 9 (if requesting new QDL distributor) | No |
| 18 | Raw material Mill change | Yes | COL-ASQR-FRM-0002 | Yes |
| 19 | Change of raw material, including buying material in an alternate condition and then heat treating to meet the drawing requirements | Yes | COL-ASQR-FRM-0002 | Yes |
| 20 | A change in numerical control program or translation to another media | Yes | COL-ASQR-FRM-0002 | Yes |

| Item | Type of Change | Is Collins Approval Required? | If approval is required, submit the below form through an SRI | Is a full or partial FAI required? Determination of full or partial FAI is dependent on what characteristics were effected by the change. |
|---|---|---|---|---|
| 21 | HSCOTS part (reference HSM236) – moving from the use of one approved supplier to another on a Collins source-controlled drawing. | No, the sources listed are already approved. | n/a | Yes, an FAI would be required from each approved source. |
| **Process Change Notification (PCN) for COTS & HSCOTS (reference HSM236)** | | | | |
| 22 | Supplier Name Change – no product impact | Yes | COL-ASQR-FRM-0002 | No |
| 23 | Product Change – no movement | Yes | COL-ASQR-FRM-0002 | Yes, If Collins drawing affected |
| 24 | Process Change – no movement | Yes | COL-ASQR-FRM-0002 | Yes, If Collins drawing affected |
| 25 | Changes to Industry Specification listed on the Collins drawing (from one spec to another, cancelled, superseded, replaced) | Yes | COL-ASQR-FRM-0002 | Yes, If Collins drawing is changed |
| 26 | Moving manufacturing to existing site (Collins approved) | Yes | COL-ASQR-FRM-0002 | Yes, HS COTS Value Added only |
| 27 | Moving manufacturing to a new site (Collins not approved) | Yes | COL-ASQR-FRM-0002 | Yes, HS COTS Value Added only |
| 28 | Obsolete / alternate / variant part offerings | Yes | COL-ASQR-FRM-0002 | Yes |