



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 1 of 43
Process Owner: Quality Manager	Document Owner: Supplier Quality Engineer	

DP MSD 601

Quality Requirements for Suppliers Handbook

Authored by:

John Jahangiri, Supplier Quality Engineer
Brea, CA

WARNING

This document is the property of Goodrich Corporation-Brea. You may not possess, use, copy or disclose this document or any information in it, for any purpose, including without limitation to design, manufacture, or repair parts, or obtain FAA or other government approval to do so, without Goodrich's express written permission. Neither receipt nor possession of this document alone, from any source, constitutes such permission. Possession, use, copying or disclosure by anyone without Goodrich's express written permission is not authorized and may result in criminal and/or civil liability.



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 2 of 43
--	--	--

Contents

- A. PURPOSE AND SCOPE.....3
- 1. Introduction3
- 2. Definitions/Acronyms4
- 3. Supplier Requirements.....5
 - 3.1. General Requirements5
 - 3.1.1. Special Process5
 - 3.1.2. Quality Management System6
 - 3.2. Configuration Control Requirements8
 - 3.3. Record Retention.....8
 - 3.4. Human Resource Requirements8
 - 3.5. Packaging, Preservation of Product8
 - 3.5.1. Packaging.....8
 - 3.5.2. Material Storage and Environmental Control8
- 4. Revision History.....10
- Appendix A: Frozen Processes11
- Appendix B: First Article Inspection Requirement12
- Appendix C: Non-Conforming Product/ Deviation and Waivers.....13
- Appendix D: Scorecards.....14
- Appendix E: Certificates of Conformance/Compliance15
- Appendix G: Export/Import Compliance.....17
- Appendix H Direct Ship Authority18
- Appendix I: Key Supplier Certification Process (Dock to Stock Requirements).....19
- Appendix J: Counterfeit Parts Prevention20
- Appendix K: Requirements for Suppliers of Maintenance, Repair, and Overhaul (MRO), Calibration, Deliverable Software/Firmware, and Test Services23
- Appendix L: Critical Characteristic Management26
- Appendix M: Purchase Order Quality Control Requirements (QCR)29

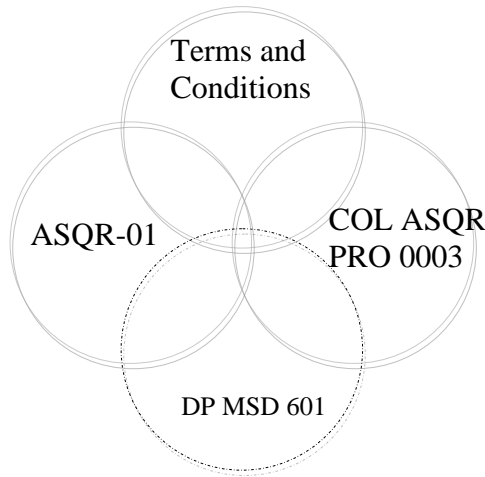
Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 3 of 43
---	--	--

A. PURPOSE AND SCOPE

This document defines additional Supplier Quality Requirements for Hoist and Winch (H&W).

Note: DP MSD 601 supersedes MSD 601 requirements.

1. Introduction



DP MSD 601 supplements the requirements of our Terms and Conditions, ASQR-01, and COL-ASQR-PRO-0003. All requirements of these documents are required as part of compliance to H&W Quality Requirements, including any applicable referenced documents, industry standards, regulatory and compliance documents, and drawing items. These requirements are in addition to any purchase order requirements that are in effect and do not replace them. Electronic copies of requirements can be found at the following links:

Document	Document Title	Link / Location
DP MSD 601	Quality Requirements for Suppliers	https://www.utcaerospace.com/supplier-documents/ (in Hoist and Winch section)
COL-ASQR-PRO-0003	Supplier Quality Common Supplier Requirements	https://www.utcaerospace.com/supplier-documents/ (in Collins Aerospace section)
ASQR-01	Supplier Quality System Requirements	https://www.rtx.com/suppliers/united-technologies-suppliers/united-technologies-asqrd

DP MSD 601 also provides minimum requirements for suppliers of products or services that may impact H&W product, such as Maintenance, Repair, and Overhaul (MRO), Calibration, Deliverable Software/Firmware, and Test Services suppliers. These requirements are provided in Appendix M.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 4 of 43
---	--	--

2. Definitions/Acronyms

Certificate of Compliance: A legal document provided by the supplier that includes the requirements of the certificate of conformance, and specifically cites and certifies that all military, industry, material, and special process specifications referenced on the drawing have been met.

Certificate of Conformance: A legal document provided by the supplier that states their compliance to all applicable drawing, specification, and purchase order requirements.

C-Drawings: H&W drawings for off-the-shelf component items. However, in some instances features are added or customized beyond the current off-the-shelf configuration.

Deliverable Software: All software, including software embedded in deliverable hardware and deliverable firmware.

Deviation: A specific written authorization granted prior to the manufacture of an item to depart from a particular requirement (s) of an item's currently approved configuration documentation for a specific number of units or a specified period of time.

Direct Material: Material that goes into and forms a permanent part of the end product. Services that may affect the form, fit or function of these materials is included in this definition.

FAI: First Article Inspection

FAIR: First Article Inspection Report

First Production Article: The first items of a production run that are the result of a planned process designed to be used for future production of these same items. Prototype parts, or parts built using methods different from that intended for the normal production process, shall not be considered as first article production parts.

Frozen Process: A manufacturing process that has been identified by H&W or H&W customers that shall not be changed without prior H&W approval. These include process operating parameters, sequence of operation, material or sources.

H&W: Hoist and Winch

NADCAP: National Aerospace and Defense Contractors Accreditation Program

NDT: Nondestructive testing

Non-Conforming Product: Any material or product that does not meet the associated engineering drawing or specification or was not processed in accordance with the proper specification or procedure.

Non-Deliverable Software: Software used in the design, manufacture, inspection, test acceptance, or calibration that has a direct effect on a deliverable product. Examples include but not limited to:

- Computer Numerical Control (CNC)

- Gage Calibration

- Coordinate Measurement Machine (CMM)

- Programmable Logic Control (PLC)

- Performance Acceptance Test

- Burn-in

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 5 of 43
---	--	--

OEM: Original Equipment Manufacturer

Product Acceptance Records: Official records to be maintained by the supplier indicating a product passing through planned operations and satisfying planned requirements during product realization (e.g. signed routers, completed ATP data sheets)

Quality Control Requirements (QCR): Quality Control requirements applicable to suppliers.

Quality Management System (QMS): The collection of documents and procedures and standard practices that are used to define and effectively implement the organizations quality goals.

Raw Material: Unfinished constituents of a finished product, material that requires further processing to become the finished product.

Root Cause Corrective Action (RCCA): Action taken to eliminate or reduce the cause of an existing non-conformity, defect, or other undesirable condition at the most fundamental level.

RTCA: Radio Technical Commission for Aeronautics

SCAR: Supplier Corrective Action Request

Special Process: A process which may alter the chemical or physical properties of the item. The impact of such a process cannot typically be evaluated without destructive testing. H&W subscribes to all special processes listed in ASQR-01 and COL-ASQR-PRO-0003.

Standard Part: A part manufactured in complete compliance with an established U.S. Government or industry accepted specification which includes design, manufacturing, and uniform identification requirements. The specification must include all necessary information to produce the part.

Variable Data: Data available when a characteristic can be measured on a continuous scale using variable gaging.

Waiver: A written authorization to accept an item, which during manufacture or after having been submitted for acceptance is found to depart from specified requirements but is suitable for use as is or after a repair.

3. Supplier Requirements

3.1. General Requirements

3.1.1. Special Process

All suppliers (regardless of tier) shall use only H&W special process sources unless otherwise permitted by contract for the special processes listed in ASQR-01 and COL-ASQR-PRO-0003. A supplier may request that a source be added to the approved special process listing through the ASQR 01 Form 3 process. However, such sources may not be used prior to being listed. A listing of approved Special Process Suppliers can be obtained through your Collins Aerospace buyer.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 6 of 43
---	--	--

For all special processing that requires NADCAP accreditation, the supplier shall provide a certificate of conformance verifying each special process or NDT method was performed by a NADCAP-accredited source with each shipment. Certification shall provide evidence of compliance to drawing, specification and/or purchase order and contract requirements in accordance with Appendix F of this document.

3.1.2. Quality Management System

All suppliers of direct material to H&W will be evaluated on-site by H&W per the risk-based program outlined in the following table in accordance with ASQR-01. Suppliers will be evaluated annually for risk rating. High risk suppliers will be notified of their status.

Suppliers with low risk rating may be considered for high risk rating if significant performance concerns are discovered. Immediate countermeasures may also be put into place including issuing SCAR(s) to the supplier or implementing additional inspection. Examples of significant concerns include:

- 1) The supplier receives multiple major non-conformances during their audit.
- 2) The supplier is unable to provide adequate corrective action to findings.
- 3) The corrective action response is submitted after the due date.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 7 of 43
---	--	--

Risk based Supplier Quality Requirements Audit Frequency (7.3)				
Risk Rating	Certification Level	AS9100 Audit	DP MSD 601 including ASQR01 and COL ASQR PRO 0003	Flight Safety Audit + ASQR01+ COL ASQR PRO 0003
High	AS9100, 9110, 9120 Certified	Supplier shall permit H&W access to all data in OASIS. H&W will evaluate need for Registrar escalation.	H&W will conduct onsite audit each year. Frequency subject to adjustment based upon H&W risk mitigation activities and/or supplier audit performance.	H&W will conduct onsite audit each year for suppliers with identified flight safety characteristics.
	ISO9001 Certified	Supplier will make available the current ISO9001 certificate to H&W upon request. H&W will conduct onsite AS9100 audit (delta to ISO9001) every 3 years minimum.		
	No QMS Certification	H&W will conduct onsite GAP to AS9100 audit every 3 years minimum.		
Low	AS9100, 9110, 9120 Certified	Supplier shall permit H&W access to all data in OASIS.	H&W will conduct onsite audit every 3 years minimum.	H&W will conduct onsite audit every 3 years minimum.
	ISO9001 Certified	Supplier will make available the current ISO9001 certificate to H&W upon request. H&W will conduct onsite AS9100 audit (delta to ISO9001) every 5 years minimum.		
	No QMS Certification	Onsite GAP to AS9100 audit every 5 years minimum.		

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 8 of 43
---	--	--

3.2. Configuration Control Requirements

If any second tier subcontract is required, the sub-tier may not then further subcontract the purchase order.

3.3. Record Retention

Records shall be sent to H&W within 48 hours of requesting them.

3.4. Human Resource Requirements

The supplier shall ensure that all personnel working for or on behalf of the supplier in activities relevant to the realization of product or services provided to or for H&W, are aware of:

- their contribution to product or service conformity;
- their contribution to product safety;
- the importance of ethical behavior.

3.5. Packaging, Preservation of Product

3.5.1. Packaging

Each Purchase order line item (lot) must be boxed separate from other Purchase Order line items (lots) to be delivered to H&W.

3.5.2. Material Storage and Environmental Control

When age controlled material is involved, the supplier shall identify each material container with the month, day, and year manufactured, and the time period before expiration (applies to delivered product). Test reports and/or certifications shall include the expiration date in a month, day, and year format. H&W reserves the right to reject and/or return any material with less than seventy-five percent (75%) shelf life remaining unless covered by other H&W documentation.

Note: Material covered under vendor managed inventory may be excluded from this requirement.

When temperature controlled material is involved the supplier shall provide material packaging suitable to maintain proper temperature during transportation from their facility to H&W. Supplier shall provide necessary temperature measuring equipment to monitor the material during transportation to assure compliance to the specifications of the Purchase Order/Contract. Packaging for such material shall be clearly marked as



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 9 of 43
---	--	--

containing temperature controlled material. H&W reserves the right to reject or return any material where temperature storage requirements have been exceeded.



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 10 of 43
---	--	---

4. Revision History

Revision	Issue Date	CHANGE DESCRIPTION
-	March 30, 2020	Initial Release at DP MSD 601



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 11 of 43
---	--	---

The following appendices apply to all suppliers unless specifically excluded by purchase order or other agreement.

Appendix A: Frozen Processes

During the H&W Critical Design Review or during a subsequent Quality review, Frozen Processes may be established for some products per Appendix N. Frozen processes shall be identified as such on the supplier's manufacturing router or shop traveler. These processes shall not be changed without H&W approval. Changes refer to process parameters, equipment, tooling or plant layout as well as a change of sub-tier supplier.

Requests for frozen process change approval shall be submitted to the H&W buyer through the proper ASQR form.

The supplier shall also flow this requirement to applicable sub-tiers.

All changes to frozen processes will require new first article inspection report in accordance with AS9102 and this document.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 12 of 43
---	--	---

Appendix B: First Article Inspection Requirement

Supplier must retain the most recent FULL FAI for all active part numbers, regardless of record retention timelines, even after a subsequent delta FAI has been submitted.

First article inspection reports sent to H&W require certification of compliance and material certification traceable to the original manufacturer, including all vendors who may have also handled the product. This also applies to delta FAI when material is affected.

Note - AS9102 FAI forms are available at www.sae.org/aaqg/publications/as9102a-faq.htm.

Note – For H&W drawings used to procure supplier Off-The-Shelf (OTS) products (C-drawings), FAI is only required for the specific characteristics controlled by the H&W drawing (e.g., painting an OTS screw would require an FAI on the paint only).

COTS or Catalog Items that are procured through a H&W drawing, that only require bag and tag, shall be excluded from this requirement.

COTS or Catalog items that are modified beyond just bag and tag, still require FAI and this requirement applies.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 13 of 43
---	--	---

Appendix C: Non-Conforming Product/ Deviation and Waivers

Suppliers shall take the following steps when nonconforming material is found and cannot be reworked—i.e., repair and use-as-is dispositions. A Deviation/Waiver request is not required for conforming reworked material.

1. Identify the nonconforming material and segregate it in a bonded area.
2. Submit a H&W Request for Vendor Variation Request (VVR) detailing the discrepancy, quantity discrepant, the cause and corrective action to eliminate the discrepancy and the effectivity point of the correction. Corrective action must be in 8D format per AS13000 (Problem Solving Requirements), ARP9136 (Root Cause Analysis and Problem Solving).

VVR request forms are available upon request from a H&W Buyer

Repair procedures must be approved by H&W in advance of their use on H&W product. Approval of the repair procedure does not imply final acceptance of the product.

Known defective parts/material is not to be sent to H&W without an approved VVR. This approved document shall be shipped with parts.

Note that VVRs are subject to both quality rating impact and potential chargeback for cost of processing, 8D Corrective Action Review, and/or require on-site audit by H&W team or delegate.



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 14 of 43
---	--	---

Appendix D: Scorecards

In order to keep suppliers appraised of their level of performance in the delivery of goods and services to H&W, scorecard data will be compiled and used as a metric. There are metrics for both on-time delivery and quality. Scorecard data will be sent to suppliers. Suppliers are responsible for keeping contact information up to date.

The delivery metric is the percent of lots delivered “One Time Delivery” aka OTD. OTD is measured from the receipt to H&W dock vs. the purchase order due date. A tolerance window of zero calendar days late to three calendar days early has been established. The goal is 100% OTD.

The standard quality metric for all suppliers is the quantity of parts nonconforming divided by the quantity of parts received. The goal is zero defects for all delivered products.

Suppliers are expected to work with H&W personnel to continuously find process and cycle time improvements as well as cost reductions.

Suppliers shall maintain an acceptable H&W performance rating. Failure to meet the H&W performance rating requirements may result in supplier disapproval.

Scorecards for Key Suppliers

Additional Supplier Gold scoring criteria are applied to suppliers identified by H&W as key suppliers. These criteria are established as a means to facilitate our key suppliers’ ability to achieve stated objectives and include the following:

Supplier Health Assessment (SHA)

Market Feedback Analysis (MFA)

Your buyer or supply chain quality representative can provide your status as a key supplier and provide the detailed criteria.

Scorecards for the key H&W suppliers can be provided by your buyer or supply chain supplier quality representative.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 15 of 43
---	--	---

Appendix E: Certificates of Conformance/Compliance

In addition to requirements specified in COL ASQR PRO 0003, C of Cs shall include Government contract number where applicable. Certifications from a sub-tier to the supplier shall provide traceability to the manufacturer and manufacturing lot, and between any additional suppliers within the supply chain pipeline.

Suppliers performing special processes shall list the number and revision level of the applicable process specification (s), lot size, lot number or heat number, sample size, applicable process specifications/controls and applicable test results. If the job was processed using a NADCAP accredited process, the supplier shall include a statement indicating the job was processed per their NADCAP accreditation and shall include their accreditation number and expiration date.

For raw components purchased from circuit card assembly suppliers: The supplier shall provide a Certificate of Conformance, and if required, the original component manufacturer's Certification.

Material purchased from H&W, and then subsequently repurchased, shall show traceability via the original PO to H&W used to acquire the material.

Certificate of conformance documentation requirements from distributors can be met in one of the following ways:

- 1) Original manufacturer's certifications shipped with material or parts plus the distributor's certification.
- 2) Distributor's certification referencing OEM documentation that is maintained on file. Distributors in this category are designated as "Qualified Distributors" and must be licensed by the manufacturer to distribute product or registered to ISO-9001, AS-9100, or AS-9120. Additional H&W requirements may also apply.
- 3) For distributors of raw material, documentation with shipments must include physical and chemical properties reports traceable to heat code or lot number.



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 16 of 43
---	--	---

Appendix F: Communication and Responsibilities

When H&W source inspection is required at the suppliers facility it shall be after supplier inspection and prior to packaging and shipment. In-process inspection or witness of MTP/ATP when required by purchase order need not be performed prior to customer inspection. Supplier shall supply the purchase order or contract including amendments, drawings, specifications, and applicable records, certifications and all necessary measuring equipment. Evidence of source inspection must be indicated on the inspection or MTP/ATP record and the shipping paperwork.

The H&W buyer must be notified at least forty-eight hours (48) in advance of the time product is to be inspected. H&W reserves the right to waive source inspection.

When a purchase order specifies “Government Source Inspection required,” the supplier shall immediately furnish a copy of the purchase order to the government representative who has delegation for the suppliers’ facility. If the supplier does not have such a representative, the supplier shall notify the government inspection service fourteen (14) days in advance, when possible, of the time when such inspection will be required.

In the event that an item becomes obsolete, H&W requires 12 months prior notification of such and reserves the right to make a ‘last buy’ to insure uninterrupted delivery to the end customer.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 17 of 43
---	--	---

Appendix G: Export/Import Compliance

The supplier, and their sub-tier suppliers as applicable, shall comply with all export-import control laws and regulations including, but not limited to, the U.S. Export Administration Regulations (EAR) and the U.S. International Traffic in Arms Regulations (ITAR) to the extent applicable to the supplier and H&W respective activities under the Purchase Order.

Any supplier who manufactures defense articles or furnishes defense services for H&W is required to register with the U.S. Directorate of Defense Controls per ITAR Part 122.

Follow the link below to register.

https://www.pmdtc.state.gov/?id=ddtc_kb_article_page&sys_id=def5f542dbf8d30044f9ff621f961959

Follow the link below for ITAR Part 122.

https://www.pmdtc.state.gov/?id=ddtc_kb_article_page&sys_id=%2024d528fddbfc930044f9ff621f961987

If the data or product provided under the H&W Purchase Order is controlled for US export-import reasons, such data/product will not be further disclosed, exported or transferred in any manner to any other foreign national person (internal or external to the supplier or sub-tier suppliers) or any foreign country contrary to U.S. export-import law.

Prior to a supplier sub-contracting to a foreign facility for product under H&W design control, they must obtain approval from the H&W International Trade Compliance Group. Supplier is also responsible for obtaining any required export authorizations necessary to allow a foreign facility to product the product under H&W design control. Supplier is required to provide H&W with a certification that such authorization has been obtained, including the number of the authorization. If a supplier has any questions on export jurisdiction for H&W designed product, contact H&W.

When supplying product to H&W that is under supplier design control, the supplier shall provide the export classification jurisdiction (e.g., Export Classification Control Number (ECCN), ITAR USML classification), Harmonized Tariff Schedule (HTS) Code, and the Country of Origin information for that product (e.g., on the shipping documentation).

The supplier is required to notify H&W of part or component status changes in regards to facility, address, and country of origin, export control classification jurisdiction and HTS code. The supplier may use ASQR-01 Form 3 or a form with the required information from their own document system. The form must be signed by an authorized supplier representative.



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 18 of 43
---	--	---

Appendix H Direct Ship Authority

A supplier may be granted direct shipment authority allowing them to ship directly to H&W customers. This approval will be granted by H&W and would only be valid for that location. Special instructions for direct ship will be contained in the purchase order.



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 19 of 43
---	--	---

Appendix I: Key Supplier Certification Process (Dock to Stock Requirements)

Suppliers are expected to achieve a Certified Supplier status and become eligible for dock to stock shipments. Suppliers are classified in the following categories:

Certified – A supplier that has demonstrated sufficient levels of process capability, such that the requirement for H&W inspection can be completely removed. By maintaining the required quality performance and successfully completing a process audit, suppliers are eligible to ship parts under the dock to stock program.

Designated – A supplier that participates in the Designated Supplier Quality Representative (DSQR) program. Incoming inspection requirements are removed from H&W and replaced by source inspection performed by a designated supplier quality representative.

Approved – Initial status assigned to a production supplier. Incoming inspection will be required at H&W until such time that quality performance results are consistently being met

Directed Inspection - In the event a supplier fails to meet quality performance expectations, H&W may elect to employ a 3rd party source inspector to oversee the processing and release of product to H&W. Any costs associated with the implementation of directed inspection would be the responsibility of the supplier.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 20 of 43
---	--	---

Appendix J: Counterfeit Parts Prevention

Suppliers providing electronic assemblies, components, or containing electronic components to H&W shall be compliant to this section. Further guidance can be found in SAE AS5553.

Procurement Precedence

1. Electronic parts shall be purchased directly from the OEM or their Franchised Distributors whenever available. Product lead-time and cost shall not preclude adherence to this provision.

Parts from the OEM or their Franchised Distributors shall have:

- Original manufacturer warranty
- Acquisition traceability to the OEM via proper packaging, handling, storage, and shipping.
- OEM Certificates of Conformance per Appendix F.

2. Electronic parts that are out of production and not available per section 1 may be procured through a Broker with prior H&W site approval and providing component authenticity has been establish per this section.

- Certificates of Conformance and acquisition traceability (CoCT) shall be provided.
- Reasonable effort shall be made to verify authenticity of the documentation by the purchasing company.
- Brokers shall be AS9120 accredited and have an active counterfeit part detection program in accordance with AS6081. H&W Supply Chain Management shall review relevant databases (ERAI, GIDEP) to evaluate broker's history of supplying counterfeit components prior to approval.
- Inspection protocols F, A, B of Testing/Analysis Table shall be performed. Test reports shall be reviewed and approved by H&W prior to shipment.
- Suppliers should notify the appropriate site buyer to request Design activity for component replacement or circuit card re-design per local site procedure.

3. Electronic parts not available per section 1 or 2 may be procured from a Broker without CoCT only after H&W site approval and component authenticity verification per Component Verification section and Testing/Analysis Table.

- Broker shall be AS9120 accredited and have an active counterfeit part detection program in accordance with AS6081. SCM shall review relevant databases (ERAI, GIDEP) to evaluate broker's history of supplying counterfeit components prior to approval.
- Suppliers shall notify the appropriate site buyer to request Design activity for component replacement or circuit card re-design.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 21 of 43
---	--	---

Component Verification

All inspection and testing shall be performed to the original manufacturer's specifications and parameters. Steps A, B, C, D, E, and F should be performed in order. General inspection methodology can be found in ARP6328, AS6081, and IDEA-STD-1010. If a nonconformance is found, stop testing, reject the lot, and notify the site buyer. Testing shall only be performed by test houses pre-approved by the cognizant H&W Supplier Quality Engineer.

A: Visual Inspection

Each lot to be delivered shall be subjected to a visual inspection at an AQL of 1.0 or tighter with 40x minimum magnification. 100% of the remaining lot shall be visually inspected without magnification. Visual inspection shall include but is not limited to: verifying lot/date codes against manufacturers database, correct English spelling, manufacturer's logo, evidence of component remarking, damage, bent leads, chip-outs, scratches, cracks, terminal finish inconsistent with manufacturer's specification for that part number, any discrepancies to the pin one indicating area, and inconsistencies between the upper and lower mold of the component. See ARP6328 section 3.5.1.2 for detailed guidelines.

B: Authenticity Verification

Each lot to be delivered shall be subjected to an inspection at an AQL of 1.0 or tighter. Testing shall include verification of the components physical attributes to the original manufacturer's drawing, swabbing, and other applicable testing to verify authenticity. Swabbing shall be performed in accordance with ARP6328 section 3.5.1.5.

C: X-ray Inspection

Each lot to be delivered shall be subjected to an inspection at an AQL of 1.0 or tighter. X-ray inspection shall include checking for the presence of the die, cracks in the epoxy, checking wire bonds, product or manufacturing markings that are X-ray detectable and any mixed die configurations within the same lot/date code. See ARP6328 section 3.5.1.8 for detailed guidelines.

D: Electrical Testing

Electrical testing of each lot to be delivered shall be completed at an AQL of 1.0 or tighter. Testing shall include verifying electrical specifications from the original manufacturer's technical data sheets as approved by H&W per ARP6328 section 3.5.10. Testing must be performed at thermal temperatures as identified on the OEM specification.

E: Destructive Physical Analysis

Each lot to be delivered shall be subjected to a DPA inspection of 2% to a maximum of 30 units per lot code. Inspection shall include verification of authenticity of the die and any other internal features that may be shown on the original manufacturer's technical data. See ARP6328 section 3.5.1.14 for guidance.

F: Plating Inspection



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 22 of 43
---	--	---

Each lot shall be verified for lead finish per manufacturer’s specification using appropriate methodology such as X-Ray Fluorescence (XRF) per ARP6328 section 3.5.1.9

Testing/Analysis Requirements—by Component Type

Component Type	Plating Inspection (F)	Visual Inspection (A)	Authenticity Verification (B)	X-ray Inspection (C)	Electrical Testing (D)	Destructive Physical Analysis (DPA) (E)
Capacitors	X	X			X	
Connectors	X	X	X			
Crystals	X	X	X	X	X	X
Diodes	X	X			X	
Fuses	X	X			X	
Heat Sinks		X	X			
IC	X	X	X	X	X	X
Inductors	X	X	X		X	
LED	X	X			X	
Mechanical Parts		X	X			
Potentiometer	X	X			X	
Relays	X	X	X		X	
Resistors	X	X			X	
Speakers		X			X	
Switches		X	X			
Transformers	X	X	X		X	
Transistors	X	X			X	

Disposition and Reporting of Counterfeit Parts

Disposition and Segregation

Nonconforming parts shall be segregated and dispositioned per this document. Confirmed counterfeit parts shall be prevented from re-entering the supply chain.

Reporting

All occurrences of counterfeit parts shall be documented and reported, as appropriate, through local H&W site procedures and to external organizations (i.e. GIDEP, ERAI, law enforcement agencies). For contracts in which DFARS is cited, a GIDEP shall be issued. Membership and reporting through ERAI (Electronics Retailers Association International) or other industry organizations is strongly encouraged.

Liability

Suppliers shall be held liable for any counterfeit parts entering H&W supply chain up to and including all costs incurred by H&W resulting from the counterfeit parts.



Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 23 of 43
---	--	---

Appendix K: Requirements for Suppliers of Maintenance, Repair, and Overhaul (MRO), Calibration, Deliverable Software/Firmware, and Test Services

Suppliers providing MRO, Calibration, Deliverable Software/Firmware, and Test Services to H&W shall meet the following minimum requirements unless specifically excluded by purchase order or other agreement. Any change in status of the quality management system shall be communicated to H&W

1. MRO Suppliers

All MRO suppliers must meet all applicable requirements of DP MSD 601 including any other specifications on purchase order or contract. MRO suppliers shall provide, at a minimum, a Certificate of Conformance for the service provided. In addition, all U.S.-based MRO service-suppliers for commercial articles must obtain a FAA approved drug and alcohol program per 14 CFR Part 120 and retain it on file with H&W.

Non-certificated MRO Suppliers

MRO suppliers who do not hold a repair station certificate shall be monitored and maintained in accordance with H&W procedures. An on-site audit of the supplier to the current checklist, SISF00243, will be performed for inception of the MRO supplier by or on behalf of H&W and every two years at a minimum. Regardless of FAA Part 145 certification, suppliers must allow right of entry for the FAA.

Certificated MRO Suppliers

A certificated MRO supplier shall have, at a minimum, FAA Part 145 certification and/or an equivalent national aviation repair authority certification. An initial onsite audit to the current checklist, SISF00243, must be performed by H&W or on behalf of H&W for inception of certificated MRO service providers, to include appropriate rating and capability.

2. Calibration Suppliers

Calibration suppliers shall be compliant to ISO/IEC 17025. Original Equipment Manufacturers of the equipment to be calibrated that are providing calibration services shall be compliant to AS9100 or ISO9001

Certifications of Calibration received from the calibration supplier shall contain the required information as outlined within ISO 17025.

3. Deliverable Software/Firmware Suppliers

Deliverable Software/Firmware Supplier Requirements

- All plans discussed in this section shall be submitted to H&W for review and approval prior to the start of the development process. All subsequent revisions/changes shall also be submitted for review and approval.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 24 of 43
---	--	---

- RTCA/DO-178 and AS 9115 shall be the preferred approach for all software/firmware development and quality management. The supplier shall complete and maintain a checklist that defines the RTCA/DO-178 and AS 9115 requirements and supplier compliance to these requirements.
- RTCA-DO-254 and AS 9100 shall be the preferred approach and quality management system for firmware product realization requirements.

The Software Quality Assurance (S/W QA) Plan shall include the following:

- A description of the S/W QA environment, including the scope, organizational responsibilities and interfaces, standards, procedures, tools and methods.
- A statement of the S/W QA authority, responsibility and independence, including the approval authority for software products.
- The S/W QA activities that are to be performed for each software life cycle process and throughout the product development including:
 - S/W QA methods, (e.g., reviews, audits, reporting, inspections, and monitoring of the software life cycle processes, etc.)
 - Activities related to the problem reporting, tracking and corrective action system
- A description of the method used to ensure disposition and retention of any remaining S/W QA open action items, change requests, and completion of all software development tasks at the conclusion of the program
- A definition of the records to be produced by the S/W QA process

The Software Development Plan (SDP) shall include the following:

- Identification of software being developed
- Resources (e.g., requirement, design code and verification environment, etc.)
- Organizational structure and responsibilities
- Software Development process (e.g., including prototype and flight test software, etc.)
- Software Development schedule and milestones
- Quality and project records
- Integrated Product Teams
- Formal reviews
- Computer resource utilization
- Corrective action process
- Risk management
- Control and development of software tools
- Software metrics
- Subcontractor management
- Security and safety requirements
- Data Management/Software Development libraries including documents to be produced
- Program language(s)

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 25 of 43
---	--	---

- Standards (e.g., requirements, Design code, etc.)
- Development and formal configuration management (if included in the SDP)

The Software Configuration Management Plan shall include both the developmental and formal configuration management process and the following:

Note: This plan can be included as part of the SDP.

- Configuration Identification of all life cycle artifacts (e.g., Software unique identifier, etc.)
- Configuration Control (e.g., Developmental and Formal, etc.)
- Subcontractor Configuration Management
- Organization and Resources
- Software Configuration Management Roles and Responsibilities
- Storage, Handling and Security
- Authorization including the release of project media and master versions of software
- Version Control
- Configuration Status Accounting
- Configuration Audits (e.g., Physical, Functional and Software Development Library Audits, etc.)
- Access Control

The Software Test or Verification Plan shall address Computer Software Unit or Module Test and Computer Software Configuration Item (CSCI) Test and include the following:

Note: This plan can be included as part of the SDP.

- Identification of the CSCI
- Software Test Environment including hardware and software elements
- How installation and Test activities are controlled
- Configuration and Change Control including test environment
- Regression Analysis
- Data Recording, Reduction, Analysis, and Retention including a plan for formal results

4. Test Service Suppliers

Test service suppliers shall be compliant to ISO/IEC 17025.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 26 of 43
---	--	---

Appendix L: Critical Characteristic Management



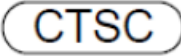


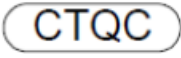
When critical to quality (CTQ) characteristics have been identified by H&W, the six symbols defined below are typically used. The characteristics are either safety critical or non-safety critical.

Note: If UTAS-PRO-0028 is referenced on the drawing, this section should provide guidance.

KPC1 and KPC2 are generally applied when variable data can be used to statistically control the process. Management of Process Variation per ASQR-01 4.1.13 and gage R&R of $\leq 20\%$ per ASQR-01 8.2.4 apply.




Frozen process characteristics are often used in association with attribute data or when destructive testing is required. Appendix A applies when frozen process characteristics are present.

CTSC and CTQC designations apply to supplier designed equipment.

	Variable Data	Frozen Process	Supplier Designed
Safety Critical			
Non-safety Critical			

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 27 of 43
---	--	---

The following table provides detailed descriptions for the standard Collins characteristics:

Symbol	Description	Objective and Requirements
	An observable safety characteristic (such as a dimension or feature) of a Safety Part, assembly, subassembly or system, that if not produced within the prescribed acceptance limits, could directly result in an unsafe condition.	Statistical Management – Safety Applied to safety characteristics that benefit from variation management and thus require the use of Statistical Process Control – Due to safety significance of the characteristic 100% inspection is also required.
	An observable quality characteristic (such as a dimension or feature of a part, assembly, subassembly or system) if varied from the prescribed acceptance limits may impact performance, form, fit, function, reliability, service life or possible mission abort, failure to launch, prevent readiness for use resulting in extreme customer dissatisfaction.	Statistical Management – Non-safety Applied to quality characteristics that benefit from variation management and thus require the use of Statistical Process Control.
	Frozen Safety Characteristic (FSC) typically cannot be directly inspected, such as material flow, grain structure, cold work depth, metallurgy, etc. shall be subjected to periodic comprehensive (destructive) testing. May be used for assembly sequence or presence of a detail or feature where absence or mis-assembly may result in an unsafe event.	Frozen Process Management – Safety Processes that create, affect or inspect this characteristic shall be managed under safety frozen process control. Initial process and all changes, including nonconforming material assessment, to a frozen process shall be approved by H&W prior to implementation. Per ASQR-01 4.2.4 3., a 40 year record retention applies. Per ASQR-01 8.3 b), rework of nonconforming product is not allowed.

<p>Quality Requirements for Suppliers--Handbook</p>	<p>Revision: - Revision Date: 2021/03/30</p>	<p>Instruction No: DP MSD 601 Page Number: 28 of 43</p>
--	--	---

<p>CTQP</p>	<p>Critical-to-Quality Process (CTQP). Applied to quality characteristics that are not directly observable and can benefit from control of the process that produces them. Based on an assessment of risk by Collins Engineering, processes specified on the Engineering drawing (i.e. cleaning, soldering, torque, etc.) that have the greatest impact on the quality or operation of the product.</p>	<p>Frozen Process Management – Non-safety</p> <p>Processes that create, affect or inspect this characteristic shall be managed under frozen process control. Initial process and all changes to a frozen process shall be approved by the H&W Quality Authority (and/or designee) responsible for the design prior to implementation.</p>
<p>CTSC</p>	<p>Critical-to-Safety Characteristic (CTSC). Elements or functions of a part or assembly that have the greatest impact to the safety of the product. This designation is only used for producer designed items procured via Source Control or Vendor Item (Spec Control) drawings. CTSCs drive the selection of FSCs and KPC1s.</p>	<p>Safety Function communication</p> <p>Applied to Collins engineering procurement documents to communicate safety function to be managed by the producers design and manufacturing system. Additional approval of the H&W Product Safety Review Board or their documented designee is required to assign or change this characteristic at the design level, including non-conforming material reviews.</p>
<p>CTQC</p>	<p>Critical-to-Quality Characteristic (CTQC). Elements or functions of a part or assembly that have the greatest impact to the quality or operation of the product. This designation is only used for producer designed items procured via Source Control or Vendor Item (Spec Control) drawings. CTQCs drive the selection of KPC2s.</p>	<p>Critical To Quality Function communication</p> <p>Applied to Collins engineering procurement documents. Characteristic to be managed by the producers design and manufacturing system.</p>
<p>Safety Parts Drawing/ Document</p>	<p>Will be included in an area adjacent to the title of all product definition documents where a safety part is identified or contained.</p>	<p>Product Definition document annotation – Safety</p>

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 29 of 43
---	--	---

Appendix M: Purchase Order Quality Control Requirements (QCR)

Appendix M describes the general and special product assurance requirements that are in addition to the requirements in DP MSD 601 and all documents called out therein (e.g. ASQR-01, COL-PRO-0003, DP MSD 601, etc). The requirements specified in Appendix P will be included on the purchase order, contract, or other formal agreement between a supplier and Collins Aerospace. All quality control requirements listed below are considered active clauses.

16. BEARINGS

All lubricating bearings shall be identified with the lubrication type, the date that they were lubricated and the date when the bearing need to be re-lubricated.

18. FUNCTIONAL TEST CERTIFICATIONS

Each shipment must be accompanied by a legible and reproducible copy of the Suppliers Certification Identifiable with submitted material for which test reports are on file and available for examination. This certificate must contain the signature of the authorized representative and assure conformance to specified requirements.

A - Actual tests results required.

B - Test Certificate of Conformance Required.

NOTE:

Test certificate of conformance of actual tests are defined as operational inspection, e.g., Mechanical, Electrical, or Hydraulic.

19. PRESSURE OR LEAK TEST

Each shipment shall be accompanied by a legible and reproducible copy of reports of test results, identifiable with test parameters and products submitted. These reports must contain the signature of the authorized representative of the agency performing the test and must assure conformance to specified requirements.

20. STATISTICAL PROCESS CONTROL (CONTROL OF KC/KP CHARACTERISTICS)

Both SAE AS9103 “Management of the Variation of Key Characteristics” and Collins Specification S-372 “Requirements for Implementing Process Controls” apply to this order. Documentation and data shall be managed via the Supplier’s Managed File Transfer account.

21. PROCESS CERTIFICATION

Each shipment must be accompanied by legible and reproducible copy of a certificate containing the signature of an authorized representative for all processes used, such as heat treating, welding, surface preparation and treatment, etc. The certificate shall include the process used, the specification to which it conforms and the name of the sub-tier that performed them if other than the supplier. When parts are serialized, serial number must appear on the certification.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 30 of 43
---	--	---

A. Critical Parts: All critical parts listed in Collins S-370 Critical Parts Specification are required to be serialized when processed. Each special process certification must list all serial numbers in the submitted lot. Certification must also have traceability to the supplier job number and the job/lot certificate of conformance.

22. NON-DESTRUCTIVE TEST REPORTS

Each shipment shall be accompanied by a legible and reproducible copy of actual Non-destructive Results identifiable with acceptance requirements and material submitted. These reports must contain the signature and title of the authorized representative of the agency performing the inspection and must assure conformance to specified requirements Fluorescent Penetrant~ Magnetic Particle, Radiographic and other non-destructive evaluation processes as referenced on drawings and / or specifications shall be accomplished by Inspection personnel certified in accordance with MIL-STD-410 or applicable standard. Parts that have been accepted using FPI or Mag particle inspection shall be marked per the applicable non-destructive test specification.

23. RADIOGRAPHIC INSPECTION

Radiographic inspection results shall be reported on a certification that includes the film reader's name and qualification level (MIL-STD-410). Certifications shall include serial numbers (when applicable and the signature and title of an authorized representative. Unless otherwise specified, radiographic inspection of castings shall be performed after all heat- treat operations. Radiographic techniques shall be submitted to H&W with the first article sample. Subsequent radiographic technique changes shall be approved by H&W.

- A. Radiographic films to be submitted with shipment.
- B. Radiographic films to be retained by the supplier and made available to H&W's request.

Note: Film shall not be destroyed without prior written approval from H&W purchasing.

24. HEAT TREAT REPORT

Each shipment shall be accompanied by a legible and reproducible copy of the detailed heat treatment cycle used. Details to include date, time, temperature, actual Case Depth Recording on the Heat Treat Certificate, quench method and using sampling plan that meets D1-8007 to achieve NDT Hardness check, if thermal treatment is to achieve final drawing requirements. Unless otherwise specified all parts hardened to Rc 40 and above must be Nital Etch inspected after grinding. Nital/Temper Etch Inspection reports must accompany the heat treat report. The report must contain the signature and title of the authorized representative of the agency performing the tests and inspections.

27. PROPRIETARY PRODUCTS

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 31 of 43
---	--	---

Unless otherwise specified by contract, supplier shall notify the buyer in writing of any class I change proposed in product design, performance specification, materials or material processes of the proprietary products as ordered there under, and shall obtain buyer's approval prior to effecting any such proposed changes. (REF.: DOD-STD-480, MIL-STD-481).

Non-Conforming Material -Supplier Design Components (Proprietary Products)

The supplier shall have a documented and implemented non-conforming material control System Suppliers providing products of their own design may perform material review in accordance with the current issue of MIL-STD-1520 for that non-conformance's that are defined as Type II.

Type I Non-conformance is defined herein as: Those goods and services which depart from contract requirements and affect one or more of the following major areas; performance, durability, inter-changeability, use or operations, weight, appearance (where a factor), health or safety.

Type I non-conformance shall be submitted on the Supplier Variation Request Form. Non-conforming material shall not be presented to H&W for acceptance without prior written approval.

Type II Non-conformance is defined herein as: Those goods and services that depart from contract requirements and are minor in that they do not affect any of the criteria specified in **Type I**. Under no circumstances shall the supplier or his sub-tiers perform any repair operations without prior written approval from H&W. The supplier shall ensure that the responsibilities for non-conforming materials extend to sub-tiers. Type II non-conformances shall be submitted to H&W for concurrence.

30. SUPPLIER INSPECTION REPORT

The supplier shall provide with each shipment a detailed written inspection report. Each characteristic (including drawing notes) inspected or tested shall be listed as a single line entry and shall indicate the acceptability of that characteristic, including all actions taken in connection with an identified discrepancy. Inspection and testing records shall, as a minimum, indicate the nature of the observations together with the number of observations made and the number and type of deficiencies found. Inspection/testing records shall, as a minimum include the following information:

1. Suppliers name
2. PO number
3. Drawing or plan Revision
4. Quantity Inspected
5. Quantity Accepted (list serial numbers when applicable)
6. Quantity Rejected (list serial numbers when applicable)
7. Characteristics Inspected

Every new lot of parts manufactured shall have a new first article per AS9102 and a copy shall be shipped with the parts.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 32 of 43
---	--	---

NOTE: When this QCR is applied to a critical part, the critical characteristics defined on its drawing will require 100% inspection and recording of their actual results on ALL the parts in the entire lot. When variable data is obtained, the high and the low measured dimensions must be recorded and the tool used to measure must be identified. When attribute data (go no-go) is used, the report will still be required identifying the person and gage used in the inspection process and the results. . All of the manufacturing personnel affected by this QCR must be trained on its interpretation and objective evidence of the training created.

34. RAW MATERIAL REQUIREMENTS – IDENTIFICATION

A SHEET OR PLATE STOCK - METALLIC OR NON METALLIC

Each sheet or plate furnished on this order shall be identified by continuous stenciling, of sufficient size to be readily legible, applied by permanent ink or dye of contrasting color, non-injurious to material surfaces and not soluble in cutting and coolant oils. Stencil markings shall occur 12-inch spacing between rows of stenciling. Information must include material type and designation, material, heat number and size.

B ROD, BAR OR TUBE - 1/4 INCH CROSS SECTION OR LARGER

Each length of rod bar or tube furnished on this order shall be identified by continuous stenciling, of sufficient size to be readily legible, applied by permanent ink or dye of contrasting color, groups of stencil characters shall not exceed ~ 2 inched. Information shall include material type or designation, material specification and heat number.

C ROD, BAR OR TUBE - LESS THAN 1/4 INCH CROSS SECTION

Rod, bar or tube furnished on this order shall be identified as specified below: Bars shall be securely bundled together, each bundle containing bars from a single heat of material and an adhesive label or marking tape shall be securely affixed to each end of each bar. This labeler tape shall be permanently marked to indicate material type or designation, material specification and heat number. The label or tape shall be wrapped around or otherwise tightly fastened to avoid projection, and shall be coated to provide protection from weather and normal handling.

D CASTINGS MARKING

Each Casting furnished on this order shall be marked in such a manner as to display part Number, “melt” number, heat treat lot (if applicable) and serial number (if applicable).

E TEST SAMPLES

The seller shall furnish for the buyer verification testing one (1) additional product or suitable test sample of the same original material lot and processed simultaneously with the lot of product (s) supplied on this Purchase Order. Both the test sample and seller shipping documents shall identify the sample, part number, process and both or lot number.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 33 of 43
---	--	---

F RAW MATERIAL CERTIFICATION

Each shipment shall be accompanied with legible copies of the material certification as furnished by the raw material supplier or an independent test laboratory. Material certifications must agree in all respects with the raw material requirements of their applicable specifications. Unless otherwise specified, all certifications shall state as a minimum, the latest revision of the required specification.

35. MILL HEAT CONTROL/MILL CERTIFICATION

Assigned serial numbers must be consecutive within a mill heat. Actual mill Certifications required.

36. GEAR DATA

A legible gear chart with increment designations shall accompany each shipment of gears. Part number and serial number, which applied to the following Collins Specification S-355 (Gear Inspection Guideline), Table I, II, III requirements (if applicable).

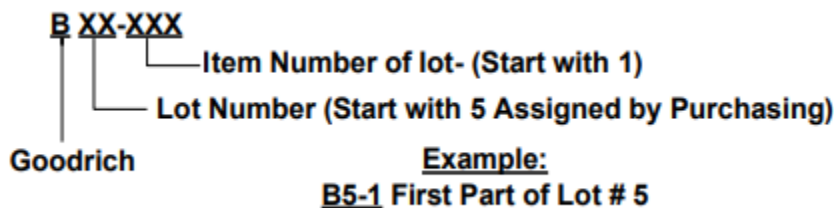
- A. Table I - Timing Gears: Sample inspection by composite action
- B. Table II - Inspected 100% by composite action and sample inspected analytically for lead error.
- C. Table III - Inspected 100% by composite action and 100% analytically for lead error.

NOTE: Composite action can be inspected by using the (4) elements for analytical Inspection: Lead, Profile, Tooth to Tooth and Pitch.

37. LOT SERIALIZATION REQUIRED

A. Each part on this order shall be marked with a unique lot serial number provided by purchasing. All parts manufactured and/or processed, as a group in the same time frame shall constitute a lot. If more parts are made than the quantity on the P.O., the supplier shall request additional serial numbers from H&W purchasing. Marking shall be in accordance with Collins’ Standard Specification S-369.

B. MSL (Matched Set Lot) Serialization. Parts that are processed as a set must be identified with a unique MSL (Matched Set Lot) number provided by Purchasing. Both parts of the set must be marked with the same number. Marking shall be in accordance with Collins’ Standard Specification S-369.



Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 34 of 43
---	--	---

40. VALIDATION OF WIRING HARNESSSES (A.K.A ELECTRICAL CABLES)

The Supplier's manufacturing method must be validated to meet drawing requirements PRIOR to delivery of production items. The Supplier shall provide the following PRIOR to start of production:

- 1) A copy of the proposed shop traveler with all in process inspection points for H&W approval.
- 2) The in-process inspection will be performed by H&W source inspection.
- 3) Source inspection request will be by email, 1-2 days prior completion of the operation for source to be scheduled. This is required for all inspection operations and FAI review.

The Supplier shall provide the following PRIOR to delivery of production harnesses:

- 1) A First Article Inspection Report (FAIR) in accordance with the requirements as outlined in Appendix B. FAI will be reviewed and accepted by H&W source inspector. Ref. AS9102 Form 1, Block 23 (Inspector name & stamp).
- 2) The first article specimen (the part from which the actual FAIR recorded values are derived),
- 3) A copy of the Supplier's manufacturing instructions (router, traveler, etc.),
- 4) Acceptance test data sheet per drawing or specification (if acceptance testing is required by PO), and
- 5) Tooling drawing or specification (if the PO includes tooling).

The FAIR cannot be approved until all items described above are received by H&W.

The specimen (see 2 above) must be identified with a tag to include the following information:

- a) The Supplier name,
- b) The part number,
- c) The revision letter,
- d) The FAIR date, and
- e) The phrase "First Article".

The shipping documents must clearly state the delivered item is a "First Article" and reference the PO line that specifies first article (if applicable).

The above items shall be reviewed by H&W to validate the product of the Supplier's manufacturing process meets requirements. H&W Procurement shall notify the Supplier of the results. If the results are positive, the H&W Buyer shall notify the Supplier that production material may be delivered. If the results are negative, the Buyer shall notify the Supplier of the reason for disapproval.

NO PRODUCTION MATERIAL MAY BE DELIVERED WITHOUT APPROVAL BY H&W.

Once the process validation is accomplished, the Supplier's manufacturing instructions (see 3 above) are "frozen". When the Supplier plans a change to the manufacturing process that affects the fit, form (including any changes of material), or function of the product, including sub-tier

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 35 of 43
---	--	---

suppliers used for manufacturing or special processing, the Supplier shall submit the proposed change to H&W for approval. H&W reserves the right to reject process changes based on the effect of the changes on the final product.

A THE ITEM MAY BE UTILIZED FOR PRODUCTION.

B THE ITEM MAY NOT BE UTILIZED FOR PRODUCTION; THE ITEM MAY BE EITHER SECTIONED OR DISASSEMBLED FOR EVALUATION.

41. VALIDATION OF PRINTED CIRCUIT BOARD ASSEMBLIES (PCBA)

The Supplier's manufacturing method must be validated to meet drawing requirements PRIOR to delivery of production items. The Supplier shall provide the following PRIOR to start of production:

- 1) A copy of the proposed shop traveler with all in process inspection points for H&W approval.
- 2) The in process inspection will be performed by H&W source inspection.
- 3) Source inspection request will be by email, 1-2 days prior completion of the operation for source to be scheduled. This is required for all inspection operations and FAI review.

The Supplier shall provide the following PRIOR to delivery of production PCBA's:

A First Article Inspection Report (FAIR) in accordance with the requirements as outlined in Appendix B.

- 1) The first article specimen (the part from which the actual FAIR recorded values are derived), FAI will be reviewed and accepted by H&W source inspector. Ref. AS9102 Form 1, Block 23 (Inspector name & stamp).
- 2) A copy of the Supplier's manufacturing instructions (router, traveler, etc.),
- 3) Acceptance test data sheet per drawing or specification (if acceptance testing is required by PO),
- 4) Tooling and/or test equipment drawing or specification (if the PO includes tooling), and
- 5) Bare board coupon, if QCR 41B (see below) applies.

The FAIR cannot be approved until all items described above are received by H&W. The specimen (see 2 above) must be identified with a tag to include the following information:

- a) The Supplier name,
- b) The part number,
- c) The revision letter,
- d) The FAIR date, and
- e) The phrase "First Article".

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 36 of 43
---	--	---

The shipping documents must clearly state the delivered item is a “First Article” and reference the PO line that specifies first article (if applicable). The above items shall be reviewed by H&W to validate the product of the Supplier’s manufacturing process meets requirements. H&W Procurement shall notify the Supplier of the results. If the results are positive, the H&W Buyer shall notify the Supplier that production material may be delivered. If the results are negative, the Buyer shall notify the Supplier of the reason for disapproval.

NO PRODUCTION MATERIAL MAY BE DELIVERED WITHOUT APPROVAL BY H&W.

Once the process validation is accomplished, the Supplier’s manufacturing instructions (see 3 above) are “frozen”. When the Supplier plans a change to the manufacturing process that affects the fit, form (including any changes of material), or function of the product, including sub-tier suppliers used for manufacturing or special processing, the Supplier shall submit the proposed change to H&W for approval. H&W reserves the right to reject process changes based on the effect of the changes on the final product.

A PRINTED WIRING BOARD COUPON NOT REQUIRED.

B PRINTED WIRING BOARD TEST COUPON REQUIRED. TEST COUPONS ARE TO MEET THE REQUIREMENTS OF MIL-PRF-55110G.

42. VALIDATION OF MACHINED PARTS

The Supplier’s manufacturing method must be validated to meet drawing requirements PRIOR to delivery of production items.

The Supplier shall provide the following PRIOR to start of production:

- 1) A copy of the proposed shop traveler with all in process inspection points for H&W approval.
- 2) The in process inspection will be performed by H&W source inspection.
- 3) Source inspection request will be by email, 1-2 days prior completion of the operation for source to be scheduled. This is required for all inspection operations and FAI review.

The Supplier shall provide the following PRIOR to delivery of production parts:

- 1) A First Article Inspection Report (FAIR) in accordance with the requirements as outlined in Appendix B. FAI will be reviewed and accepted by H&W source inspector. Ref. AS9102 Form 1, Block 23 (Inspector name & stamp).
- 2) The first article specimen (the part from which the actual FAIR recorded values are derived),
- 3) A copy of the Supplier’s manufacturing instructions (router, traveler, etc.),
- 4) A copy of the Supplier’s inspection plan¹, and
- 5) Tooling drawing or specification (if the PO includes tooling).

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 37 of 43
---	--	---

NOTE 1:

The inspection plan is to describe at what stage(s) of manufacture inspection will be performed and how it will be accomplished. If the inspection plan includes a Coordinate Measuring Machine (CMM) program, a printout of the program shall be provided. If the plan includes dedicated tooling (for set-up), a diagram or photo of the tooling and/or set up shall be provided.

NOTE 2:

If the tooling has been manufactured by the Supplier, and procured by H&W, then the Supplier shall provide a copy of the tooling drawing or specification.

The FAIR cannot be approved until all items described above are received by H&W.

The specimen (see 2 above) must be identified with a tag to include the following information:

- a) The Supplier name,
- b) The part number,
- c) The revision letter,
- d) The FAIR date, and
- e) The phrase "First Article".

The shipping documents must clearly state the delivered item is a "First Article" and reference the PO line that specifies first article (if applicable).

The above items shall be reviewed by H&W to validate the product of the Supplier's manufacturing process meets requirements. H&W Procurement shall notify the Supplier of the results. If the results are positive, the H&W Buyer shall notify the Supplier that production material may be delivered. If the results are negative, the Buyer shall notify the Supplier of the reason for disapproval.

NO PRODUCTION MATERIAL MAY BE DELIVERED WITHOUT APPROVAL BY H&W.

Once the process validation is accomplished, the Supplier's manufacturing instructions (see 3 above) are "frozen". When the Supplier plans a change to the manufacturing process that affects the fit, form (including any changes of material), or function of the product, including sub-tier suppliers used for manufacturing or special processing, the Supplier shall submit the proposed change to H&W for approval. H&W reserves the right to reject process changes based on the effect of the changes on the final product.

43. VALIDATION OF ASSEMBLIES (MECHANICAL, ELECTRO- MECHANICAL AND HYDRAULIC)

The Supplier's manufacturing method must be validated to meet drawing requirements PRIOR to delivery of production items.

The Supplier shall provide the following PRIOR to start of production:

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 38 of 43
---	--	---

- 1) A copy of the proposed shop traveler with all in process inspection points for H&W approval.
- 2) The in process inspection will be performed by H&W source inspection.
- 3) Source inspection request will be by email, 1-2 days prior completion of the operation for source to be scheduled. This is required for all inspection operations and FAI review.

The Supplier shall provide the following PRIOR to delivery of production parts:

- 1) A First Article Inspection Report (FAIR) in accordance with the requirements as outlined in Appendix B. FAI will be reviewed and accepted by H&W source inspector. Ref. AS9102 Form 1, Block 23 (Inspector name & stamp).
- 2) The first article specimen (the part from which the actual FAIR recorded values are derived),
- 3) A copy of the Supplier's manufacturing instructions (router, traveler, etc.),
- 4) Acceptance test data sheet per drawing or specification (if acceptance testing is required by PO),
- 5) Inspection plan*, and
- 6) Tooling and/or test equipment drawing or specification (if the PO includes tooling).

***NOTE:**

The inspection plan is to describe at what stage(s) of manufacture inspection will be performed and how it will be accomplished.

The FAIR cannot be approved until all items described above are received by H&W.

The specimen (see 2 above) must be identified with a tag to include the following information:

- a) The Supplier name,
- b) The part number,
- c) The revision letter,
- d) The FAIR date, and
- e) The phrase "First Article."

The shipping documents must clearly state the delivered item is a "First Article" and reference the PO line that specifies first article (if applicable).

The above items shall be reviewed by H&W to validate the product of the Supplier's manufacturing process meets requirements. H&W Procurement shall notify the Supplier of the results. If the results are positive, the H&W Buyer shall notify the Supplier that production material may be delivered. If the results are negative, the Buyer shall notify the Supplier of the reason for disapproval.

NO PRODUCTION MATERIAL MAY BE DELIVERED WITHOUT APPROVAL BY H&W.

Once the process validation is accomplished, the Supplier's manufacturing instructions (see 3 above) are "frozen". When the Supplier plans a change to the manufacturing process that affects

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 39 of 43
---	--	---

the fit, form (including any change of material), or function of the product, including sub-tier suppliers used for manufacturing or special processing, the Supplier shall submit the proposed change to H&W for approval. H&W reserves the right to reject process changes based on the effect of the changes on the final product.

44. VALIDATION OF CASTINGS AND FORGINGS

The Supplier's manufacturing method must be validated to meet drawing requirements PRIOR to delivery of production items.

The Supplier shall provide the following PRIOR to start of production:

- 1) A copy of the proposed shop traveler with all in process inspection points for H&W approval.
- 2) The in process inspection will be performed by H&W source inspection.
- 3) Source inspection request will be by email, 1-2 days prior completion of the operation for source to be scheduled. This is required for all inspection operations and FAI review.

The Supplier shall provide the following PRIOR to delivery of production parts:

- 1) A First Article Inspection Report (FAIR) in accordance with the requirements as outlined in Appendix B. FAI will be reviewed and accepted by H&W source inspector. Ref. AS9102 Form 1, Block 23 (Inspector name & stamp).
- 2) The first article specimen (the part from which the actual FAIR recorded values are derived),
- 3) Tooling 2 drawing or specification (if the PO includes tooling), and
- 4) Physical and chemical test reports

NOTE 1:

The inspection plan is to describe at what stage(s) of manufacture inspection will be performed and how it will be accomplished. If the inspection plan includes a Coordinate Measuring Machine (CMM) program, a printout of the program shall be provided. If the plan includes dedicated tooling (for set-up), a diagram or photo of the tooling and/or set up shall be provided.

NOTE 2:

If the tooling has been manufactured by the Supplier, and procured by H&W, then the Supplier shall provide a copy of the tooling drawing or specification.

The FAIR cannot be approved until all items described above are received by H&W.

The specimen (see 2 above) must be identified with a tag to include the following information:

- a) The Supplier name,
- b) The part number,
- c) The revision letter,
- d) The FAIR date, and

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 40 of 43
---	--	---

e) The phrase “First Article”.

The shipping documents must clearly state the delivered item is a “First Article” and reference the PO line that specifies first article (if applicable).

The above items shall be reviewed by H&W to validate the product of the Supplier’s manufacturing process meets requirements. H&W Procurement shall notify the Supplier of the results. If the results are positive, the H&W Buyer shall notify the Supplier that production material may be delivered. If the results are negative, the Buyer shall notify the Supplier of the reason for disapproval.

Once the process validation is accomplished, the Supplier’s manufacturing instructions (see 3 above) are “frozen”. When the Supplier plans a change to the manufacturing process that affects the fit, form (including any change of material), or function of the product, including sub-tier suppliers used for manufacturing or special processing, the Supplier shall submit the proposed change to H&W for approval. H&W reserves the right to reject process changes based on the effect of the changes on the final product.

NO PRODUCTION MATERIAL MAY BE DELIVERED WITHOUT APPROVAL BY H&W.

45. VALIDATION OF CRITICAL PARTS NOT COVERED BY OTHER SPECIFIC 40 SERIES

The Supplier’s manufacturing method must be validated to meet drawing requirements PRIOR to delivery of production items.

The Supplier shall provide the following PRIOR to start of production:

- 1) A copy of the proposed shop traveler with all in process inspection points for H&W approval.
- 2) The in process inspection will be performed by H&W source inspection.
- 3) Source inspection request will be by email, 1-2 days prior completion of the operation for source to be scheduled. This is required for all inspection operations and FAI review.

The Supplier shall provide the following PRIOR to delivery of production parts:

- 1) A First Article Inspection Report (FAIR) in accordance with the requirements as outlined in Appendix B. FAI will be reviewed and accepted by H&W source inspector. Ref. AS9102 Form 1, Block 23 (Inspector name & stamp).
- 2) The first article specimen (the part from which the actual FAIR recorded values are derived),

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 41 of 43
---	--	---

- 3) A copy of the Supplier's manufacturing instructions (router, traveler, etc.),
- 4) A copy of the Supplier's inspection plan, and
- 5) Tooling drawing or specification (if the PO includes tooling).

NOTE 1:

The inspection plan is to describe at what stage(s) of manufacture inspection will be performed and how it will be accomplished. If the inspection plan includes a Coordinate Measuring Machine (CMM) program, a printout of the program shall be provided. If the plan includes dedicated tooling (for set-up), a diagram or photo of the tooling and/or set up shall be provided.

NOTE 2:

If the tooling has been manufactured by the Supplier, and procured by H&W, then the Supplier shall provide a copy of the tooling drawing or specification.
The FAIR cannot be approved until all items described above are received by H&W.

The specimen (see 2 above) must be identified with a tag to include the following information:

- a) The Supplier name,
- b) The part number,
- c) The revision letter,
- d) The FAIR date, and
- e) The phrase "First Article".

The shipping documents must clearly state the delivered item is a "First Article" and reference the PO line that specifies first article (if applicable).

The above items shall be reviewed by H&W to validate the product of the Supplier's manufacturing process meets requirements. H&W Procurement shall notify the Supplier of the results. If the results are positive, the H&W Buyer shall notify the Supplier that production material may be delivered. If the results are negative, the Buyer shall notify the Supplier of the reason for disapproval.

NO PRODUCTION MATERIAL MAY BE DELIVERED WITHOUT APPROVAL BY H&W.

Once the process validation is accomplished, the Supplier's manufacturing instructions (see 3 above) are "frozen." When the Supplier plans a change to the manufacturing process that affects the fit, form (including any changes of material), or function of the product, including sub-tier suppliers used for manufacturing or special processing, the Supplier shall submit the proposed change to H&W for approval. H&W reserves the right to reject process changes based on the effect of the changes on the final product.

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 42 of 43
---	--	---

46. FROZEN PROCESS

Once the process validation is accomplished, the Supplier's manufacturing instructions are "frozen". When the Supplier plans a change to the manufacturing process that affects the fit, form (including any changes of material), or function of the product, including sub-tier suppliers used for manufacturing or special processing, the Supplier shall submit the proposed change to H&W for approval. H&W reserves the right to reject process changes based on the effect of the changes on the final product.

51. CRITICAL PARTS REQUIREMENTS

- a) Collins Standard S-370 identifies Critical Parts and specific manufacturing procedures for processing and handling of the parts.
- b) All Supplier manufacturing documents: Drawings, Work Sheets, Routers, Inspection Plan, Control Plans shall be clearly identified with "Critical Part" to bring attention to personal Involved in manufacturing and inspections,
- c) In addition, a statement will added to the documentation "Frozen Process no changes to this process shall be made without Collins approval"
- d) Provision for Collins approval shall to be added to supplier planning or router document master.

All of the manufacturing personnel must be trained on the interpretation of "Critical Part" and objective evidence of the training created for all personnel working with the parts this QCR applies to.

52. REQUIREMENTS FOR REPAIR STATION SUPPLIERS

Suppliers performing work or services for H&W Brea repair station products must comply with FAA Regulation - Drug & Alcohol Testing CFR Part 120 by:

- a) Maintaining a current FAA Repair Station Part 145 Certificate or,
- b) Register with the FAA and begin a drug testing program,
- c) Initiate and maintain a testing program that meets CFR 120 requirements,
- d) Provide evidence of compliance of CFR. Part 120 to H&W prior to acceptance of work.

52A. GOVERNMENT PROPERTY MANAGEMENT THAT APPLIES TO REPAIR STATION SUPPLIERS:

For products submitted to repair station suppliers that are government property, the Supplier has the following obligations for controlling property and will:

- a) Maintain records, secure, protect, and maintain property
- b) Ensure property is used only where authorized by the assigned contract, including purchase order and sub-contractors
- c) Ensure proper disposition of property as required

Government Furnished Property (GFP) FAR 52.245-1(a) - Property in the possession of, or directly acquired by, the Government and subsequently furnished to the Contractor for



Brea, CA

Quality Requirements for Suppliers--Handbook	Revision: - Revision Date: 2021/03/30	Instruction No: DP MSD 601 Page Number: 43 of 43
---	--	---

performance of a contract. Government-furnished property includes, but is not limited to, spares and property furnished for repair, maintenance, overhaul, or modification. Government furnished property also includes contractor-acquired property if the contractor-acquired property is a deliverable under a cost contract when accepted by the Government for continued use under the contract.

Government Property (GP)- All property owned or leased by the Government and includes Government Furnished Property (GFP) and Customer Acquired Property (CAP). GP also includes material, equipment, special tooling (ST), special test equipment (STE) and real property.