

MI 7.4-18 Quality Requirements, Rev Q

1. Purpose

- 1.1 The purpose of this document is to define the methods for creating and modifying GKN Aerospace – St. Louis Quality Requirements.

2. Definitions and Acronyms

- 2.1 Quality Requirement (QR) - a defined special purchase order condition relative to quality assurance needs for procured direct materials.
- 2.2 Integrated Product Team (IPT) - A cross-functional team tasked with reviewing and deploying customer requirements.
- 2.3 SCM - Supply Chain Management

3. Responsibilities

- 3.1 Supply Chain Management Quality Engineering & Quality IPT Representatives will:
 - 3.1.1 Identify the need for new or revised Quality Requirements (QRs) as a result of their participation on IPT Teams reviewing customer contract requirements in accordance with MI 7.1-4.
- 3.2 Supply Chain Quality Engineering will:
 - 3.2.1 Approve and post updates to the Quality Requirements on the GKN Virtual Community web-site for supplier access as changes occur and audit the requirements flowdown process through IPT activity.
 - 3.2.2 Post a current copy of the GKN Aerospace Design Authority Specification Matrix each month on the GKN Virtual Community website:
<http://www.gkn.com/aerospace/supplier-info/st-louis/Pages/Quality-Information.aspx>

4. Flowchart

None

5. Methods / Instructions

- 5.1 Identification of New/Modified QRs

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- 5.1.1 Quality and Supply Chain Quality representatives will identify the need for new or revised Quality Requirements (QRs) as a result of their participation on IPT's per MI 7.1-4 - Configuration Management. These same individuals will develop the necessary text regarding new or modified QRs.
- 5.1.2 The GKN QR numbering format is as follows:
 - QR# = QCXXXX, where XXXX = Unique 4 digit number
- 5.2 Review and Approval of New/Modified QRs
 - 5.2.1 Supplier Quality Engineering will update the attached list of QRs (Appendix A) and submit it along with this work instruction for approval.
 - 5.2.2 Supplier Quality Engineer will review and revise MI 7.4-24 (a) Receiving Verification Check List Reference as needed to ensure that receiving personnel are instructed to verify the inclusion of the correct documentation.
- 5.3 QR Flowdown
 - 5.3.1 Supplier Quality Engineering will monitor select purchase orders to confirm the proper flowdown of Quality Requirements from IPT reviews.
 - 5.3.2 Once approved, the latest revision of the QRs will be posted on the GKN Supplier Portal: <http://www.gkn.com/aerospace/supplier-info/st-louis/Pages/Quality-Information.aspx>. Periodic electronic and/or hardcopy mailings may be used to inform suppliers of updates to Quality Requirements; however, the GKN Supplier Portal will be the primary form of communication of the Quality Requirements to the supplier and it will be the supplier's responsibility to work to the latest revision of QRs in this website.
- 5.4 Design Authority Specification Flowdown
 - 5.4.1 Supplier Quality Engineering will retrieve a list of the current revisions of all customer specifications in GKN's QMIS Document Control at the beginning of each month.
 - 5.4.2 Supplier Quality Engineering will use this list to revise the GKN Aerospace Design Authority Specification Matrix and upload to the GKN Supplier Portal: <http://www.gkn.com/aerospace/supplier-info/st-louis/Pages/Quality-Information.aspx>.

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6. Reference Documents

| Document Number | Document Title |
|-----------------|--------------------------|
| SP 7.4 | Purchasing |
| MI 7.1-4 | Configuration Management |

7. Records

| Required Record | Custodian |
|---|----------------------------------|
| GKN Aerospace Design Authority Specification Matrix | GKN Supplier Quality Engineering |

8. Form(s)

| Form | Title |
|---------------|---|
| MI 7.4-18 (a) | Pre-Shipment Kit Quality Compliance Checklist |
| MI 7.4-24 (b) | Receiving Verification Checklist Reference |

9. Appendices

Appendix A – Purchase Order Quality Requirements (QRs)

10. Approvals

Manager, Supply Chain

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11. Revision History

| Rev | Revision Description | Requestor | Release Date |
|-----|--|--------------------------|------------------|
| A | Initial Release | N. Knittel | 06 October 2011 |
| B | Added QC 7091 – GIDEP Program | S. Lauer | 01 December 2011 |
| C | Updated QR# QC2040 – Certificates of Conformance | M. Brimer | 19 December 2011 |
| D | Revised QR# QC2098 – First Article Inspection | R. Webelhuth | 18 May 2012 |
| E | Revised QR# QC6000 – HTF7000-Specific Quality Requirements | K. Crawford | 28 November 2012 |
| F | Added QR# QC1305 – Material Substitution Prohibition - Boeing H900 Section 26 / Added Bell QRs | R. Webelhuth / M. Brimer | 10 May 2013 |
| G | Added Boeing & Government owned Tool Requirements | C. Dabbelt | 16 January 2014 |
| H | Updated GKN Supplier Website | R. Webelhuth | 28 February 2014 |
| I | Updated QC5102 to reference proper heat treat specification | N. Knittel | 25 March 2015 |
| J | Added QC5109 | N. Knittel | 06 October 2015 |
| K | Added QC2041 | R. Webelhuth | 10 November 2015 |
| L | Added QC2042 | R. Webelhuth | 09 May 2016 |
| M | Added QC2060, made several obsolete | N. Knittel | 01 June 2016 |

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| Rev | Revision Description | Requestor | Release Date |
|-----|---|-------------|-----------------|
| N | Added QRs 8100 and 8110 | N. Knittel | 05 October 2016 |
| O | Revision level O not used | -- | -- |
| P | Added QR 1400 and 2200 | D. Arbogast | 02 August 2017 |
| Q | Updates to QR 7000, 7030, 7060, 7070 and 7080 | G. Suomela | Reference QMIS |

Appendix A

GKN Aerospace - St. Louis Purchase Order Quality Requirements (QRs)

[MI 7.4-18 Rev P]

This document contains the quality requirements that are applicable when invoked by GKN Aerospace – St. Louis Purchase Orders. Use of this document is required for Contract Review and Quality Planning Activities.

QR # QC1000 – Kitting Quality Requirement Compliance Checklist

New - 04/18/03

Supplier is required to review all purchase order requirements (including applicable GKN Quality Requirements) for each constituent part/material of the supplied kit and then confirm compliance of the total kit to these requirements via completion of QR FORM QC1000 for each individual kit supplied prior to shipment to GKN. A copy of this completed form is to be included with the certificate of conformance transmitted with each shipment to GKN-STL.

QR # QC 1100 – Work related to Lockheed Martin Aeronautics Company Purchase Order

New 2/25/05

Revised – 8/25/09

Work to be accomplished in performance of this purchase order is directly related to a Lockheed Martin Aeronautics Company purchase order and must be accomplished in accordance with process specification on this purchase order and Lockheed Martin Aeronautics Company Appendices QJ, QX, and Quality Clause Q4R. All documents can be located at:

<http://www.lockheedmartin.com/us/suppliers/tandc.html>

QR # QC1206 – Government Source Inspection

New: 05/11/11

Government inspection is required prior to shipment from Seller's facility.

Upon receipt of this contract, Seller shall promptly notify and furnish a copy of this contract and all subsequent change orders to the government representative who normally services Seller's facility so that the appropriate planning for government inspection can be accomplished.

During performance of this contract, the Seller's and Seller's subcontractor's Quality and Manufacturing processes are subject to review, verification, and analysis by authorized Government

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Representatives. The inspection required by this clause may occur at any manufacturing or processing sequence as specified by the government representative.

If a government representative does not normally service Seller's facility, Seller shall furnish a copy of this contract to the nearest Defense Contract Management Agency (DCMA) office. In the event the Government representative or DCMA office cannot be located, Seller shall immediately notify Buyer's Authorized Procurement Representative.

Evidence of government inspection (Eagle Stamp or DCMA representative signature) shall be shown within the shipping documentation.

Government inspection of goods or services provided hereunder shall be performed at Seller's address shown on this contract or contract change unless a different address is specified.

QR # QC1300 – Determination of (Prime) Design Authority and Appropriate Specifications

New: 9/30/07

Revised: 10/02/09

Suppliers shall use technical data retrieved from the secure GKN Virtual Community website to determine the Prime Design Authority, location of the Prime Design Authority, and the appropriate aircraft program. The Prime Design Authority and its location shall be used to determine the appropriate process specifications, material specifications and other relevant technical data to be utilized during all fabrication processes. If such processes are accomplished via sub-contractors, it is required that this information be transmitted (flowed down) to said sub-contractors.

Suppliers shall process / fabricate to the latest revisions of customer / design authority specifications and technical data as identified on the GKN Prime Design Authority Specification Matrix at the start of manufacture. The Specification Matrix is available on the GKN Supplier Portal and it is the supplier's responsibility to review the latest version of this matrix at the start of manufacture. Any questions regarding the Specification Matrix should be directed to the GKN Buyer or Supplier Quality Engineer.

QR # QC1305 – Material Substitution Prohibition – Boeing H900 Paragraph 26 Flowdown (Modified).

New: 4/18/2013

26. MATERIAL SUBSTITUTION PROHIBITION

A. Unauthorized Material Substitution (General)

Unauthorized material substitutions are not permitted on Buyer's Goods. Unauthorized material substitution includes any deviation from the engineering definition of a raw material. Engineering definition includes Buyer design drawing and applicable specifications, product specification, form, size, shape, chemistry, melt method, origin, temper/condition, product testing or surface finish. Alternate materials specified in the engineering definition (and often described as approved material substitutions therein) do not constitute unauthorized material substitution. Terms and definitions for metallic materials and processing used herein are clarified in ARP1917.

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Contact Buyer's Authorized Procurement Representative for details regarding deviations to authorized materials. Seller agrees and understands that such deviations only apply to this purchase contract, and only as indicated in the Buyer's authorized document.

B. Metallic Materials (Specific)

Temper or Condition Conversion - Unless specifically authorized by the engineering definition, conversion of a raw material (i.e. heat treat to change the temper or condition of the material) constitutes material substitution of the condition provided by the manufacturer.

Metallic Raw Materials – Buyer's engineering drawings may refer to obsolete or superseded specifications covering several forms, thicknesses, widths, etc. of the alloy or alloys. The required characteristics of these materials are defined not only by the objective test standards of the specification, but by the processes/methods by which this final form is achieved. These requirements are often captured in the definitions of the required material forms, and may not be explicitly called out in the detailed requirements. The raw material certification results from both the process used to make it and the tests to verify basic properties.

Seller shall ensure that metallic materials covered by current or obsolete/superseded specifications are produced using the standard industry practices designed strictly for the production of stock to the specified thickness, diameter, width or cross sectional area, achieved by thermo-mechanical processing or casting process. Chemical, electrochemical and mechanical methods used for the removal of surface scale or contamination, or the production of the required surface finish, in accordance with the material specification are acceptable. Raw material must not be re-certified with respect to thickness, diameter, width or cross sectional area or product form. Machining or cutting of thicker product or other product forms shall not be supplied in lieu of specified product unless specifically authorized by Buyer. Raw material certifications for material or parts shall reflect the form and size of the raw material as originally manufactured by the raw material producer.

C. Specification Supersession:

For government specifications and standards canceled after June 1994, Seller and subcontractors at all tiers shall use the last active revision of the canceled specification and standard until an acceptable replacement is included in the requirements of this Contract. Contact the Buyer's Authorized Procurement Representative in the event of any inconsistency in applicable specification or standard.

D. Reports (Full Pedigree from melt to final product) - Raw material certifications shall show clear traceability to the manufacturer(s) of the raw material including ingot source, all thermo-mechanical processing (i.e. forging, rolling, drawing, etc), heat treatment, chemical processing and inspections as required by applicable raw material specification requirements.

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E. Chain of Custody (Disguising intermediate ownership) – Suppliers shall not disguise the pedigree of material or chain of ownership by removal of a previous supplier’s name, nomenclature or identification.

F. Source of Additional Information - Buyer’s Authorized Procurement Representative.

G. The substance of this Article shall be flowed in all subcontracts at every tier.

QR # QC1400 – Notification of NADCAP Findings

New: 11/14/16

Supplier shall promptly notify GKN via written communication to GKN Buyer and/or Supplier Quality Engineer of any documented findings resultant from NADCAP audits.

QR # QC1500 - Discretionary Government Surveillance

New 2/1/07

Obsolete 2/17/07

QR # QC1900 – Nonconformance Cost Recovery

New – 12/12/03

Revised: 6/1/16

Supplier is subject to charges for recovery of costs associated with any/all supplier-responsible nonconforming parts/materials. Such charges will at a minimum include:

| Charge Category | Part/Material Value ≤ \$500 | Part/Material Value > \$500 |
|--|-------------------------------|--------------------------------|
| Administrative Charge to process Nonconformance Documentation* | \$250/Nonconformance Document | \$250/Nonconformance Document |
| Rework required at GKN-STL** | Minimum of \$50/discrete unit | Minimum of \$200/discrete unit |
| Correction of part mark errors/omissions at GKN-STL** | 10% of discrete unit value | \$50/discrete unit |

Additional charges may also apply where:

- parts or materials, as supplied by GKN and/or its customer, require scrapping at the supplier as a result of the supplier’s actions.
- supplied parts/materials require extraordinary rework at GKN or its customer.
- GKN suspects supplied product to have a nonconformance, and additional inspection/testing is required to validate conformity.

*NOTE: Charges will be assessed for nonconformance tags initiated through the identification of nonconforming parts/materials by GKN and/or its customers as well as those initiated as a result of suppliers’ own requests for disposition of nonconforming parts/materials.

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****NOTE:** The location of rework (GKN vs. Supplier) associated with nonconformances received by GKN will be at the discretion of the GKN Buyer in order to ensure the timely supply of conforming parts/materials.

QR # QC2000 – GKN-STL Supplier Quality Assurance Manual

New – 12/12/03

Revised – 02/26/09

In the performance of this purchase agreement, the Supplier is required to comply with the latest revision of the GKN Aerospace - St. Louis Supplier Quality Assurance Manual (MI 7.4-16). The contents of this manual, as well as all required forms, may be accessed at the following GKN Supplier Portal: <http://www.gkn.com/aerospace/supplier-info/st-louis/Pages/Quality-Information.aspx>

Where Quality Requirements (QRs) other than QC2000 invoked by a GKN purchase order are in conflict with the GKN Supplier Quality Assurance Manual, such QRs will supersede requirements defined within the manual.

QR # QC2001 – GKN Receiving Address

New - 08/03/01

Obsolete – 05/12/04

QR # QC2002 – Engineering Rev Level Identification

NEW – 07/10/03

Seller shall record the end item part number, drawing level and engineering changes to which the delivered item has been manufactured to on the packing slip.

QR# QC2004 – GKN Inspection

New – 08/03/01

Obsolete – 05/12/04

QR# QC2005 – All Consigned Pre-Preg Material

New - 07/10/03

Pending GKN – St. Louis lab approval, all consigned pre-preg material will be allowed to be shipped up to 180 days from date of manufacture.

QR# QC2006 – Government Inspection (DLA)

New - 08/03/01

Revised -3/19/02

Obsolete 9/30/07

QR# QC2007 – Flight Safety / Critical Parts Traceability (Apache)

New - 08/03/01

Revised: 12/04/08

Obsolete: 6/1/16

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QR# QC2009 – Flight Safety Parts Program Plan & Program Planning Package (Apache)

New 08/03/01

Revised: 03/19/02

Obsolete: 6/1/16

QR# QC2011 – Records of Inspections, Test and Process Controls

New - 08/03/01

Revised: 05/12/04

Seller shall maintain records of all inspections, tests, and process controls associated with fulfillment of this purchase order contract. Unless alternate record retention requirements are specified elsewhere in this Purchase Order or its attachments, (i.e. engineering specifications, additional GKN Quality Requirement which specified a longer retention period, etc.) these documents shall be on file and available to GKN for four (4) years following the end of the calendar year in which the final entry was made or three years after the final payment under this contract, whichever expires first. At any time during the retention period, at GKN's request, Seller will deliver said records, or any part thereof, to GKN, at no additional cost to GKN.

QR# QC2015 – Chemical / Physical Analysis Test Reports

New - 08/03/01

Revised - 03/07/02

Obsolete – 9/30/07

QR # QC2016 – Boeing Hardness/Conductivity Testing Requirements

New - 09/23/02

Note: For overload contracts not involving machining operations for machined parts or sheet metal operations for sheet metal parts, these requirements do not apply.

Note: Exceptions to the following hardness testing requirement is granted for small complex geometry parts which, as a result of geometry do not allow for proper testing set-up or are subject to degradation as a result of testing. Engineering definitions that require hardness testing of a small, complex geometry part shall be coordinated with the procurement agent for changes.

Hardness and conductivity testing shall be performed in accordance with P.S. 21203 and/or P.S. 21207 (unless otherwise specified by engineering specifications) as specified below. This requirement must be met, regardless of the source for heat treatment of the material. Unless otherwise specified by the engineering definition, the material shall also meet the acceptance requirements of P.S. 23023. Records of this testing shall be maintained by the Supplier. Hardness and conductivity is to be performed after all final operations, such as machining, forming, welding or thermal treatment. Hardness testing through any surface plating or coating is not recommended, and in no case shall hardness test impressions be made through a surface plating or coating which is harder than the base material.

Only personnel qualified in accordance with Boeing IDS Process Specifications P.S. 21203 or 21207 (unless otherwise specified by engineering specifications) shall perform hardness and/or conductivity testing.

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| Material | Aluminum | | Other (except Titanium) ¹ | |
|------------------------------|---------------------|--------------|--------------------------------------|--------------|
| | Hardness | Conductivity | Hardness | Conductivity |
| Test | Hardness | Conductivity | Hardness | Conductivity |
| Machined Parts | Sample ² | 100% | 100% | None |
| Structural Sheet Metal Parts | Sample ² | 100% | 100% | None |
| Castings | 100% ³ | None | 100% | None |
| Forgings & Pressings | Sample ² | 100% | 100% | None |
| Composites | None | None | None | None |

- 1 Hardness and conductivity testing is not required for Titanium material of any kind.
- 2 Sampling plans should conform to sampling requirements noted below.
- 3 If values for a particular material type are not listed in P.S. 23023, hardness testing is not required.

Sampling Requirements:

Sampling inspection is allowed except for Mandatory Inspection Criteria (MIC's) and Key Characteristics (KCs) noted on the engineering definition or if otherwise specified in the GKN purchase order, engineering definition and/or Special Manufacturing Instructions (SMI). MIC's and KCs shall be verified on each part with variable data results recorded and made available on request. Sampling plans shall be in accordance with ANSI/ASQC Z1.4 for attribute inspections or ANSI/ASQC Z1.9 for variable inspections. Single sampling plan for Normal Inspection, General Inspection Level II, with no greater risk than an acceptance quality level (AQL) as noted in the table below for specific product types. Use of a sampling plan based on this requirement will constitute an approved sampling plan. Deviations from this requirement shall be submitted to GKN for review and submission to Boeing A & M St. Louis. Such deviations are subject to GKN and Boeing A & M - St. Louis disapproval.

| Product Type | AQL |
|-----------------------------------|-----|
| Machined Parts | 2.5 |
| Structural Sheet Metal Details | 4.0 |
| Castings, Forgings, and Pressings | 4.0 |
| Composites | 4.0 |

QR# QC2017 GKN – Hardness / Conductivity Test for Machined & Sheet Metal Parts
New - 08/03/01
Revised: 05/12/04

This QR has been superseded by QR # QC2016 – Boeing Hardness/Conductivity Testing Requirements. If QC2017 GKN is invoked by GKN purchase order, please ensure compliance with QC2016 instead.

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QR# QC2018 GKN – Castings, Forgings and Pressing Requirements

New - 08/28/01

Revised: 03/07/02

Seller of castings, forgings and pressings shall in preparation for delivery:

1. Copies of test reports for “fracture critical and fracture critical traceable” hardware shall be included in the shipping documents to GKN.
2. Castings - supplier’s packing sheet/certification shall include the master melt and/or heat number, heat treat lot number as applicable.
3. Forgings and pressings - supplier’s packing sheet/certification shall include the mill heat number, heat treat lot or serial number as applicable.
4. Forging Flash - forging flash shall be removed in accordance with applicable specification requirement.
5. Processing Operations - (tensile testing of forging and pressings) - when forgings or pressings are shipped in the annealed or normalized condition (in accordance with specification requirements) and are to be heat treated later, the tensile specimens shall be heat treated to the specified condition on the end item (i.e. the finished machined part) and tested prior to shipment.

QR# QC2019 – Pratt & Whitney Stamp

New - 07/10/03

All documentation must have the applicable Pratt & Whitney source stamp per MCL Manual section F-17.

QR# QC2020 – Unconfirmed Failure Rejections

New 9/23/02

In the event hardware delivered on this Purchase Order is rejected and returned by GKN to the Supplier and the Supplier is unable to confirm the reported failure, the Supplier shall provide the following to the Buyer and hold shipment pending GKN disposition:

- Purchase Order Number
- Part Number
- Serial Numbers
- GKN Nonconformance Tag Number
- Applicable test procedures
- Results of special tests performed by the Seller
- Supplier’s certification that test procedure used to verify the failure identified by GKN was adequate to detect those failures. Supplier shall provide the number and revision of test procedure(s) used.

QR# QC2021– Supplier CAD/CAM Inspection Data Control per D650-14831-1

New 9/23/02

Revised 10/13/03

If Supplier has Boeing DPD “Authority” during the entire product manufacturing and verification process and QR # QC2026 is on this GKN Purchase Order, the Supplier is exempt from requirements

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in this QR. If Supplier has not received and maintained Boeing DPD “Authority” the requirements of this QR apply. Supplier CAD/CAM nominal inspection data derived from master dimension identifier (MDI), master dimension definition (MDD), master dimension surface (MDS) or non-dimensioned features in the engineering CAD model will be verified and stamped as approved by Boeing Supplier Quality Management and returned to the Supplier with a cover letter stating the part number and engineering release to which the data is approved prior to use as inspection media. The data may be submitted for verification in a variety of formats including coordinate data lists, CMM program nominals, dimensioned sketches or drawings, IGES files, etc. The approved data will be used as an element of the inspection media for the specified part number. Any change in Boeing engineering and/or supplier data will require update approval and/or verification by Boeing Supplier Quality Management. Supplier CAD/CAM Q.A. data shall be controlled in accordance with D650-14831-1. Supplier shall maintain records of controlled inspection data and shall make those records available to GKN and Boeing upon request.

QR# QC2022– Requirements for Key Characteristics (KCs)

New 9/23/02

Revised 07/10/03

When Key Characteristics are specified on the drawing or purchase contract, the Seller shall utilize 100% inspection for these characteristics or employ control per SAE AS9103 – Variation Management of Key Characteristics. Data in support of either 100% inspection or control per AS9103 are to be made available to GKN and its customers upon request. Application of AS9103 does not invalidate the need to establish and document compliance with all requirements for First Article Inspection per AS9102.

QR# QC2023– Boeing Process vs. Military/Industry/Team Equivalent (F-22)

New 9/23/02

Obsolete: 6/1/16

QR# QC2024– Serialization/Traceability Requirements for Fracture Critical Category (F-22) Hardware

New 9/23/02

Obsolete: 6/1/16

QR# QC2025– GKN Process Assessment/On-site First Article Review

New 4/18/03

Prior to production part shipment approval, supplier is required to successfully pass an on-site verification of its First Article part as well as an audit of applicable production part processes/systems including processes and systems designed to ensure serialization and traceability for critical parts as applicable.

QR# QC2026– Quality Assurance for Digital Data per D6-51991

New 10/13/03

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When a supplier receives or uses Boeing digital data as authority for design and/or inspection, then the seller must comply with the requirements of D6-51991, Quality Assurance Standard for Digital Product Definition at Boeing Suppliers.

QR # QC2027 – Requirement for use of Boeing Specifications (F-22)

New - 02/17/04

Obsolete: 6/1/16

QR# QC2028 – Government Inspection (DoD, DCMA, DCMDI)

New – 08/03/01

Revised – 9/30/07

Government inspection is required prior to shipment from your plant. Arrangements for government inspection under this contract will be made by U.S. Department of Defense (DoD), Defense Contract Management Agency (DCMA), Defense Contract Management District International (DCMDI), or Defense Logistic Agency (DLA). For the correct DCMDI office, please refer to the DoD Contract Administration Services (CAS) Component Listing at:
<http://www.dcma.mil/casbook/casbook.htm>

Upon receipt of this contract promptly provide the government representative who normally services your plant with a copy of the purchase order and also copies of all subsequent change orders so that appropriate planning for government inspection of the goods can be accomplished. Evidence of government inspection shall be shown on all shipping documents.

QR# QC2029 – FAR 43.13 Performance Rules & 145.57 Performance Standards

New - 08/03/01

Revised: 05/13/02

Obsolete 4/26/06

QR# QC2030 – Fastener Certifications

New - 08/03/01

Revised: 03/07/02

If this contract is for the procurement of ASTM, ASME, SAE, MS, BAC, AN, or NAS specification fasteners, (bolts, nuts, screws, studs, washers, rivets, pins, etc. then the following applies: Certification stating materials, processes (including applicable inspection processes) and finished items were controlled and tested in accordance with requirements of this contract and applicable specifications and that such records are on file (unless the material was Buyer provided). The certification shall identify the original manufacturers and their lot numbers for each lot in the shipment. Multiple lots within a shipment shall be kept separated and clearly identified as to the original manufacturer and the lot number(s). A copy of the certification shall be included with the packing sheet for each shipment.

QR# QC2031 – Calibration – MIL-Std 45662A

New - 07/10/03

Obsolete – 05/12/04

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QR# QC2032 – Changes To Sellers Operations

New - 07/10/03

Obsolete – 05/12/04

QR# QC2037 – Quantitative Test Results

New - 08/03/01

Revised: 03/07/02

Seller shall submit with each lot, quantitative results of all tests required by the procurement specification and applicable part drawing. In addition, when part size or configuration prohibits conventional testing, the Seller shall obtain coupons of the same material and heat treat lot. These coupons shall be prepared in such a manner as to facilitate testing requirements and yield acceptable test results. Test results obtained from coupons shall be submitted with each lot and shall be identifiable to the shipment. Sellers other than original manufacturers shall not rework, alter, or modify any manufactured item. Manufacturers performing rework shall, on completion, submit the item to required specification testing. The Seller shall identify unit packages and their associated records. Such identification shall include the heat treat lot number and/or the inspection lot number. Exceptions:

1. Coupon testing will not be required for fatigue life, tension-tension fatigue requirements, and mechanical property testing, except when specifically required by the applicable procurement specification.
2. Coupon testing does not apply to component type fasteners.

QR# QC2040 – Certificates of Conformance

New 08/03/01

Revised: 10/02/09

Seller shall furnish a certificate of conformance, signed by a company representative, attesting to the compliance with all requirements of this purchase order. Such certificates shall contain lists of individual part/material serial numbers where required by specification. Seller shall maintain records of inspections, tests, and process controls (including sub-tier supplier/processor certificates of conformance/test reports) in accordance with record retention requirements imposed by this contract, which serve to substantiate this certification. The GKN buyer shall be notified and approve any exception prior to shipment.

Certification shall attest to the following:

1. Material used on this purchase order conforms to all applicable specifications. Material Alloy must be listed on the submitted Certificate of Conformance with the delivery. If material is furnished by GKN, so indicate.
2. All requirements of this purchase order, including specification and revision level conformance, and compliance with applicable GKN Quality Requirements have been met. All special processes performed must be listed on the submitted Certificate of Conformance with the delivery.
3. Distributors and jobbers must, in addition to the above certification, include the manufacturer's name for each item shipped.

Attach one (1) copy of the certification to the material involved and one copy to the shipping document(s) with each shipment. Performance of this purchase order will not be complete and final

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payment will not be made unless the required certifications of conformance have been signed or stamped by a company representative and are received by GKN.

NOTE: In addition to the above, suppliers of raw materials will be required to support GKN periodic verification and validation of these materials to specified requirements when and as directed by the applicable GKN Buyer. Support of these activities may require one or more of the following:

1. Periodic submission of the actual raw material test report (mill test report, e.g.) that states the lot of material has been tested, inspected, and found to be in compliance with the applicable material specifications
2. Submission of material samples for subsequent validation testing by GKN, or
3. Substantiation to support the supplier's own program of periodic validation and verification where they are not the raw material manufacturer themselves.

Test reports will list the specifications, including revision numbers or letters, to which the material has been tested and/or inspected and the identification of the material lot to which it applies. When the material specification requires quantitative limits for chemical, mechanical, or physical properties, the test report will contain the actual test and/or inspection values obtained.

Certifications for physical properties will likewise show actual values. If Supplier supplies converted material produced by a raw material manufacturer, Supplier is responsible for ensuring performance of all physical tests where the manufacturing process has altered the properties from what had been certified by the raw material manufacturer. The data submitted must reflect the condition of the material as offered for delivery. This data is in addition to the raw material manufacturer's test report required above.

QR# QC2041 – Responsibility for Raw Material Test Report Validation

New 03/14/03

Obsolete – 9/30/07

Revised – 10/09/2015

When Seller utilizes test reports to accept Seller purchased raw material, the following requirements apply:

Test reports shall be checked 100% against Seller's requirements and applicable specifications.

Validation test requirement: Seller shall periodically validate test reports for raw material accepted on the basis of test reports. That validation shall be accomplished by Seller or other independent party through periodic, scheduled tests of raw material samples. Schedules for frequency of tests will be established by Seller based on historical performance of the raw material supplier.

Seller shall retain test reports provided by the raw material supplier, as well as Seller's validation test results as quality records traceable to the conformance of Goods, as specified elsewhere in this Contract.

Buyer and customer furnished raw material is not subject to the validation test requirement.

Seller shall implement processes and procedures in support of this clause.

QR# QC2042 – Foreign Object Debris/Foreign Object Damage (FOD) Prevention and Control

New 04/26/16

MI 7.4-18 – Quality Requirements, Rev P

Seller is required to establish and maintain a FOD prevention program in accordance with D6-85622, “Foreign Object Debris/Foreign Object Damage (FOD) Prevention Requirements for Boeing Suppliers.”

Seller shall implement processes and procedures in support of this clause.

QR# QC2046 – Part Identification & Traceability

New 08/03/01

Revised: 03/07/02

Obsolete – 9/30/07

QR# QC2047 – Part Identification & Date of Manufacture

New 3/14/03

In addition to those part marking requirements identified on the associated blueprints/drawings, Supplier shall identify each item/part with the date of manufacture or a more process-specific lot designation in an area adjacent to the part mark identification. Identification shall be performed using those same methods and materials identified within the applicable part mark specifications referenced on the associated blueprints/drawings.

QR # QC2050- Use of Approved Suppliers / Processors

New 12/04/08

The customer or design authority governing parts made or procured by GKN may restrict the performance of certain Special Processes required in the manufacture of these parts to a limited group of companies on an Approved Supplier List (ASL). The company actually performing the Special Process (whether it be GKN’s supplier or a subcontractor performing work for GKN’s supplier) shall be listed on the ASL published by the design authority as qualified to perform that particular Special Process. If the supplier needs information about a design authority’s ASL, they should contact the GKN Buyer. It is GKN’s supplier’s responsibility to impose this requirement on their subcontractors per QC2055.

QR # QC2051 – Disclosure and Approval of Subcontracted Processes

New 5/20/11

During performance of this contract, the Seller is required to submit to GKN for approval all plans to subcontract fabrication or processing of any kind. Subcontracting any work required to complete this contract without written consent from the GKN buyer is prohibited

QR # QC2055- Flowdown of Purchase Order & Quality Requirements to Sub-tier Suppliers

New 12/04/08

All Purchase Order Requirements and Quality Requirements invoked on a Purchase Order to a GKN supplier shall be flowed by the supplier to all related sub-tier suppliers (as applicable) performing work on the items listed in said Purchase Order. In addition, it is the supplier’s responsibility to provide all documentation/information related to the Purchase Order Requirements and Quality Requirements to its sub-tier suppliers and enforce said requirements.

MI 7.4-18 – Quality Requirements, Rev P

QR# QC2060 – Boeing 787 Shipping Requirements

New: 6/1/16

Suppliers of parts for Boeing 787 aircraft are required to mark all crates/packaging with stamped placards indicating which side should be oriented upwards (“This Side Up”). Crate footings shall be oriented on the underside at all times through duration of shipment to GKN, in order for product to be safely unloaded with a fork truck.

QR# QC2074H – Single Lot / Date Parts

New 08/03/01

Revised: 03/07/02

All parts supplied under this purchase order must be of the same Lot/Date Code.

QR# QC2077D GKN – Use of Boeing Qualified Sources

New 08/03/01

Revised: 05/12/04

This QR has been superseded by QR # QC3030 – Use of Boeing Approved Special Processes. If QC2077D GKN is invoked by GKN purchase order, please ensure compliance with QC3030 instead.

QR# QC2080 – Quality System (MIL-I-45208)

New 08/03/01

Obsolete – 05/12/04

QR# QC2080A – Quality System (MIL-Q-9858)

New 08/03/01

Obsolete – 05/12/04

QR# QC2080C GKN – Quality System (AS9100)

New 08/03/01

Revised: 02/26/09

Seller shall establish and maintain a quality assurance system that meets the requirements of the latest revision of SAE AS9100, *Quality Management Systems – Requirements for Aviation, Space and Defense Organizations*. Registration by an independent registrar is not required. Future registration will be required to maintain the status of active supplier for GKN Aerospace - St. Louis. Non-registered suppliers are subject to internal process audits to determine compliance to the latest revision of SAE AS9100 by GKN or a GKN designate.

QR# QC2081 – Supplier Inspection

New 08/03/01

Obsolete – 05/12/04

QR# QC2081A GKN – Control of Nonconforming Product

New 08/03/01

Revised: 12/04/08

MI 7.4-18 – Quality Requirements, Rev P

The supplier shall control nonconforming product. This control shall provide identification, documentation, segregation (when practical) and notification of qualified supplier Quality Assurance personnel. The supplier's Quality Assurance personnel, with the assistance of Engineering if required, shall examine nonconforming material to evaluate if the material can and/or should be dispositioned rework to specification or scrap (notify GKN procurement before disposal for possible alternate use).

If product cannot be dispositioned as listed above, it shall be designated for GKN Aerospace - St. Louis Material Review Board (MRB) action. The supplier shall document the nonconformance on Form MI 7.4-16(b) – Supplier Nonconformance Record and submit this document to their GKN Buyer. Any nonconformance-related attachments should be enclosed on Form MI 8.1-11 (e) or Form MI 8.1-11 (f) and submitted along with MI 7.4-16(b). The GKN Buyer will assign a GKN External Nonconformance Number and provide it to the supplier to revise Forms MI 7.4-16(b), MI 8.1-11 (e) or MI 8.1-11 (f) and to include on Form MI 7.4-16 (d) – Deviated Supplied Parts Cover Sheet. If GKN elects to bring the nonconforming part in, the supplier shall complete MI 7.4-16 (d) and submit it to GKN along with the nonconforming part, the completed MI 7.4-16 (b) and the GKN External Nonconformance document. In addition, all supplier Certificates of Conformance shall note the GKN External Nonconformance Number. NOTE: The supplier is not authorized to ship the product to GKN unless explicit written direction has been provided by the GKN Buyer. Finally, when the product is delivered to GKN, the GKN nonconformance document number should be included in the product identification even if the nonconformance document has been closed.

The supplier shall retrieve the latest revisions of the documents above from their GKN Buyer or from the public library of the GKN Supplier Portal at <http://www.gkn.com/aerospace/supplier-info/st-louis/Pages/Quality-Information.aspx>.

QR# QC2086 – Quality System (Attached Requirements)

New 08/03/01

Obsolete – 05/12/04

QR# QC2087 GKN –Critical Parts Traceability and/or Serialization Information

New 08/03/01

Revised: 09/23/02

This part includes a requirement for inclusion of critical traceability and/or serialization data. Supplier shall provide and certify, at minimum, the following information for each part supplied:

1. Part Number, Part Dash Number, Part Serial Number, Supplier Name, Supplier Internal Control Number
2. Starting Stock Part and Dash Number, Serial Number, Stock Supplier
3. Heat Treat Vendor & Lot Number,
4. Raw Material Specification Number, Parent Plate/Forging Lot Number/Extrusion I-Teat Lot, Producer.
5. Non-Destructive Test Method, Processor, Inspector ID, NDT Technique Number,
6. All Rejection Document Numbers

MI 7.4-18 – Quality Requirements, Rev P

QR# QC2088 GKN – Boeing Non-Destructive Technique Approval

New 08/03/01

Revised: 05/12/04

Seller shall provide certification that Non-Destructive Testing (NDT) technique approval has been received from Boeing prior to shipment from Seller's facility to GKN.

QR# QC2089– Special Tooling Control (Boeing Integrated Defense Systems (IDS))

New 02/25/09

Revised: 6/1/16

If this Quality Clause is invoked, refer to QC2090.

QR# QC2090 – Property Control

New 03/07/02

Revised: 05/13/02

In the performance of this purchase agreement, the Supplier is authorized to use special tooling and/or test equipment identified herein. Such tooling and/or equipment are considered the property of GKN, GKN customer(s) or the Government and will be used solely for its intended purpose unless otherwise approved by GKN. No such tooling or equipment shall be destroyed, disposed of, or transferred without the written consent of GKN Aerospace – St. Louis. In the performance of this contract the Supplier shall be responsible for all periodic, inventory checks, inspections, maintenance and refurbishment or replacement required to manufacture, test and deliver the items ordered under this purchase agreement. The Supplier will be liable for shortages, loss damage or destruction to tooling or equipment provided in support of this purchase agreement. The Supplier's liability shall apply until GKN provides written release of such liability without regard to termination or expiration of this purchase agreement. The Supplier shall promptly investigate and report any loss, damage, or destruction of GKN, Customer or Government tooling or equipment. The reports shall include the following at a minimum:

- Purchase Agreement/Order number
- Description and item identification number
- Estimated replacement or repair cost
- Date and time of loss, damage, or destruction
- Actions taken to prevent further loss, damage, or destruction and to prevent repetition of similar incidents
- Statement that no insurance costs or other means of the subcontract covering loss, damage, or destruction of property were charged to this purchase agreement.
- Security classification of the item, if any
- All known facts or circumstances that led to the loss, damage, or destruction and a certification that the item was being used for its intended use.

The Supplier will assure the identification stickers, tags will remain on the tooling/equipment and that the identification stickers or tags are legible. The Supplier shall certify that the tooling/equipment provided herein will be recorded and maintained on the Suppliers property records.

MI 7.4-18 – Quality Requirements, Rev P

All Boeing or government-owned tools that are used for IDS production, fabricated, reworked or repaired by approved tooling suppliers, and Boeing, Government or supplier-owned tools that are used for the acceptance of products fabricated for Boeing Integrated Defense Systems (IDS) or its customers shall be controlled in accordance with D950-11059-1 “IDS Seller Special Tooling Requirements. Written approval from GKN is required before any Government or Customer owned tools are reworked or repaired except for standard line maintenance”.

The Supplier will maintain tools and equipment. At a minimum, tool maintenance shall consist of the following:

- Replace tooling pins and keys as required.
- Repair elongated tooling holes and worn keyways.
- Clean and polish working surfaces of dies as required to prevent scoring or marking of parts.
- Protect entire die with anti-oxidant after each run of parts.
- Any other minor rework not to exceed three (3) man-hours.

Cost of any tool rework or replacement, which is not covered by the above, shall be negotiated separately.

The Supplier will permit GKN, the Government, or GKN customers reasonable access to any customer or Government property. The Suppliers shall clearly identify all return shipments of tools or equipment with the purchase agreement number and the tooling/equipment identification number(s). Shipments must be accompanied by the appropriate shipping documents.

QR# QC2091 – F15 Tooling Precedence

New 7/26/06

Seller will manufacture all goods to be delivered under this contract in accordance with the buyer furnished build-to-package, which may include, but is not limited to, the GKN SMI, buyer furnished tooling and engineering drawings. In cases where the buyer furnished tooling and engineering drawings are different, the tooling shall take precedence as defined in the GKN SMI. Engineering dimensional call-outs shall not be required during First Article Inspection when a tool is the controlling media, as defined in the GKN SMI and the feature is validated to the buyer furnished tool.

QR# QC2092– Special Tooling Control (Boeing Puget Sound)

New 9/23/02

All Boeing or government-owned Special Tools that are fabricated, reworked or repaired by approved tooling suppliers, and Boeing, Government or supplier-owned Special Tools that are used as media of inspection (MOI) for the acceptance of products fabricated for Boeing Military Aircraft and Missile Systems Group (Puget Sound) or its customers shall be controlled in accordance with D658-10024-1 “Supplier Fabricated/Held/Owned Special Tools Inspection, Acceptance, and Control”. This document defines Quality Assurance requirements for acquisition and utilization of Special Tools, Tooling Supplier Surveys, Tool Design Reviews, First Product Inspections, Tool Routines, Release Status Control, Tool Inspections, Shipping/Receiving Screening Inspection, and Tool Discrepancy Control.

MI 7.4-18 – Quality Requirements, Rev P

QR# QC2093 – Quality System (Boeing A0436 – Latest Revision)

New 06/12/04

The following requirements apply to the manufacture of parts and/or materials which are Boeing designed and that are produced for subsequent GKN delivery to Boeing Integrated Defense Systems, St. Louis. The Supplier to GKN for such parts/materials shall establish and maintain a quality assurance program in accordance with the latest revision of Boeing report number A0436. This document which outlines requirements supplemental to SAE AS9003 may be accessed at: <http://www.boeing.com/companyoffices/doingbiz/quality>

QR# QC2094 – Quality System (Boeing A0436 REV. Q)

New 09/23/02

Revised 6/12/04

This QR has been replaced by QC 2093. Suppliers are to ensure compliance with QC2093 as applicable when QC2094 is invoked.

QR# QC2095 – Quality System (Boeing A0436)

New 03/07/02

Revised 6/12/04

This QR has been replaced by QC 2093. Suppliers are to ensure compliance with QC2093 as applicable when QC2095 is invoked.

QR# QC2096 – MDC/MDHS Approved Sources (Apache)

New 03/19/02

Revised: 05/13/02

Obsolete: 6/1/16

QR# QC2097 – Boeing Approved Sources

New 03/19/02

Material of this purchase order shall be procured from an Approved Supplier as indicated on the applicable Boeing Approved Vendor List (AVL) or Qualified Product List (QPL).

Shipment Documentation:

Each shipment shall be accompanied by a certification stating the name and address of the Boeing AVL source or the Government QPL source and the specification number.

MI 7.4-18 – Quality Requirements, Rev P

QR# QC2098 – First Article Inspection (AS9102)

New 04/08/02

Revised: 12/05/08

Suppliers of engineered components/parts shall perform, retain, and submit a First Article Inspection Report in accordance with the latest revision of AS9102 Aerospace First Article Inspection Requirement. Copies of the completed First Article data shall be submitted to GKN with the shipping documents of the first part or directly to the appropriate GKN Supplier Quality Engineer or Buyer and shall be maintained at the supplier's facility. GKN reserves the right to request data packages, and the requested data must be supplied within 5 business days of the request. The supplier's own equivalent forms may be used in place of those contained within AS9102 provided all required information is included. First Article Inspection Reports previously prepared in full compliance with QC 2098 are acceptable to GKN and may be retained in lieu of repeating the First Article Inspection, provided it has not been 2 years since parts were last manufactured. Any change to the manufacturing process after an approved First Article requires notification in writing to GKN.

Partial first articles are required per AS9102 section 5.3 and the requirements for submission and retention of partial first articles is the same as initial first articles. Supplier must inform GKN buyer in writing (email is acceptable) when a new or partial first article is required, as soon as the supplier plans a change, due to a change in; manufacturing location, process, equipment, sub contracting of operations, or change in tooling.

Copies of AS9102 and associated forms may be obtained by contacting SAE at <http://www.sae.org>

QR# QC2099 – F/A-18 E/F Control of Fracture & Maintenance Critical Parts (Dwg. 74A900054)

New 04/08/02

Revised: 05/13/02

Supplier shall ensure compliance with latest revision of Boeing drawing # 74A900054 – Control of Fracture and Maintenance Critical Parts for the F/A-18 E/F Aircraft.

QR# QC2100 – F/A-18 E/F Fracture Critical Traceable Parts (Dwg. 74A900053)

New 04/08/02

Revised: 05/13/02

Supplier shall ensure compliance with latest revision of Boeing drawing # 74A900053 – Serialization and Traceability Requirements for F/A-18 E/F Fracture Critical Traceable Parts.

QR# QC2101 – F/A-18 C/D Fracture & Maintenance Critical Parts (Dwg. 74A900004)

New 09/23/02

Supplier shall ensure compliance with latest revision of Boeing drawing # 74A900004 – Control of Fracture and Maintenance Critical Parts for the F/A – 18 Aircraft.

MI 7.4-18 – Quality Requirements, Rev P

QR# QC2102 – F/A-18 C/D Serialization and Traceability Requirements (Dwg. 74A900003)

New 09/23/02

Supplier shall ensure compliance with latest revision of Boeing drawing # 74A900003 – Serialization and Traceability Requirements for F/A –18 Fracture Critical Parts.

QR# QC2103 – Traceability/Serialization per 17P9M2005

New 11/06/02

This part requires traceability/serialization in accordance with the latest revision of Boeing document 17P9M2005.

QR# QC2104 – Special Control per 17P9M2004

New 11/06/02

This part requires special control in accordance with the latest revision of Boeing document 17P9M2004.

QR# QC2105 – T-45A – Fracture Critical Traceable Parts

New 7/10/03

Supplier shall ensure compliance with the latest revision of Boeing Drawing # DA000A1000 – T-45A Control of Fracture Critical Parts for serialization and traceability of fracture critical parts.

QR# QC2110 – Control of Materials and Processes for Designated Parts and Components of Boeing Products per D6-1276

New 7/1/08

QR # QC2200 Acceptance Authority Media (AAM) (BOEING X31764)

New 07/17/17

Supplier shall comply with AS/EN/JISQ requirements and 14CFR Part 21.2 regarding the application of the Acceptance Authority Media (AAM) requirements. Supplier shall, within its organization and its supply chain, ensure that the use of AAM is clearly defined within its Quality Management System (QMS). Seller shall, upon Flightline request, be able to demonstrate evidence of communication to its employees and to its supply chain; use of AAM must be considered as a personal warranty and conformity. Supplier shall maintain compliance to the AAM requirements by assessing its process and supply chain as part of its internal audit activities. The areas of focus of this assessment shall include but are not limited to:

- Authority Media Application Errors (i.e. Omission, Typos, Legibility, etc.)
- Authority Media Application Untimely Use (i.e. Documentation is not completed as planned, “Stamp/Sign as you go”, etc.)
- Authority Media Application Misrepresentation (i.e. Uncertified personnel, Falsification of documentation, Work not performed as planned, etc.)

Authority Media Application Training Deficiencies (i.e. Ethics, Culture awareness, Proper use of authority media, etc.)

MI 7.4-18 – Quality Requirements, Rev P

QR # QC 2800 – Winglet Technology Program Quality Requirements

New - 01/20/04

Obsolete 4/26/06

QR # QC3000 – First Article Engineering Evaluation

New 04/08/02

Revised – 9/30/07

Parts covered by this Quality Requirement are subjected to First Article Engineering Evaluation by Engineering Authority. Supplier shall perform a first article inspection in accordance with the latest revision of AS9102 Aerospace First Article Inspection Requirement. Two (2) copies of the First Article Inspection Report are to be submitted with the shipment of parts.

Supplier's own equivalent forms may be used in place of those contained within AS9102, provided all required information is included. Copies of AS9102 and associated forms may be obtained by contacting SAE at <http://www.sae.org> Supplier must notify the applicable GKN Buyer and/or Supplier Quality Engineer at least 10 days prior to the time the item(s) will be ready for First Article Inspection.

It is the supplier's responsibility to meet all specifications and other relevant purchase order requirements. Any results that do not meet specification requirements are cause for the supplier to withhold First Article parts and documentation. Suppliers are expected to expend every effort in order to correct the part/process so that all design record and purchase order requirements are met. If the supplier is unable to meet any of these requirements, the applicable GKN Business Unit Buyer and/or Supplier Quality Engineer shall be contacted immediately.

First Article Data Record Retention Requirements

Suppliers are to retain copies of First Articles for a period of 7 years, or in accordance with other Quality Requirements cited on the purchase order, whichever is longer. GKN Aerospace Services – St. Louis and its customers reserve the right to attend and witness any/all First Article inspections as conducted at the supplier's facility.

QR # QC3010 – Manufacturing Process/Quality Systems Reviews

New 04/08/02

Revised 01/20/04

Supplier's manufacturing processes, quality systems, and associated records/documentation are subject to review, verification, and analysis by GKN personnel, GKN Customer personnel, and/or representatives of applicable government and/or regulatory agencies/authorities on the supplier's premises at any time.

QR # QC3020 - GKN/Customer/Government - Product, Quality System and Mfg Process Surveillance

New 04/08/02

Revised 2/10/07

MI 7.4-18 – Quality Requirements, Rev P

During performance of this contract, Seller and Seller's sub-tier suppliers' quality systems, manufacturing processes, associated records/documentation and product (as supplied under this contract) are subject to on-site (at supplier premises) review, verification, and analysis by GKN personnel, GKN Customer personnel, and/or representatives of applicable government and/or regulatory agencies/authorities. These reviews may be conducted on either a random or 100% (full-time) basis. Supplier will be notified in advance should GKN, GKN's customer, and/or government regulatory agencies/authorities elect to invoke this right. Government inspection or release of product related to this contract prior to shipment is not required unless Seller is otherwise notified or a Form DD250 Government shipping document is required. If requested, Seller shall provide a copy of this contract to the Government Representative upon receipt.

QR # QC3030 – Use of Boeing Approved Special Processes

New 04/08/02

Revised: 06/12/04

The following requirement applies to the manufacture of parts and/or materials which are Boeing designed and that are produced for subsequent GKN delivery to Boeing. The Supplier shall be listed or shall utilize sources listed in the latest revision of Boeing Document D1-4426, Boeing Approved Process Sources, whenever the manufacturing and inspection type processes listed in D1-4426, or their equivalent, are used in performance of this contract, except as noted in D1-4426. If the supplier is not on distribution for the D1-4426 document, a copy may be referenced on the Boeing Web-site at <http://active.boeing.com/doingbiz/d14426/index.cfm>. Supplier shall impose this requirement on their subcontractors as well.

QR # QC3040 – Retention of Inspection Records

New 04/08/02

Revised 05/13/02

Supplier shall certify that materials, processes and/or delivered items will be controlled and tested in accordance with and meet specified contract requirements and applicable specifications, and that applicable records are on file subject to examination and will be furnished to GKN upon request. Supplier shall include with the packing slip for each shipment a completed copy of the Supplier Certificate of Conformance form. A duplicate copy of this document is to be sent to the applicable GKN buyer. Supplier shall retain production records of quality control, reliability and inspection for a period of seven (7) years from date of final payment unless otherwise specified on the PO. Supplier will have a documented procedure on record retention defining specific records and applicable retention periods/methods.

QR # QC3050 – Disposition of Nonconformances (Boeing Philadelphia)

New 04/08/02

Obsolete: 6/1/16

QR # QC3060 – Corrective/Preventive Action

New 05/13/02

Revised 3/14/03

MI 7.4-18 – Quality Requirements, Rev P

Supplier shall provide GKN with documented Corrective/Preventive Action for any/all supplier corrective action requests initiated by GKN procurement representatives. Supplier shall respond using the appropriate GKN Supplier Corrective Action Response Form as supplied by GKN and/or any applicable GKN Customer response forms. Failure to provide timely and comprehensive corrective/preventive action responses in a timely manner may result in negative impact to the supplier's GKN Supplier Performance Indicator rating.

QR # QC3070 – Quality System Requirements (Boeing X-23784)

New 5/13/02

Revised 4/26/06

Supplier is required to maintain a quality system in compliance with the latest revision of Boeing form X-23784. GKN reserves the right to conduct surveillance audits at the supplier's facility to determine that such compliance is maintained.

QR # QC3075 – Part Acceptance Stamping

New 03/14/02

Parts supplied under this purchase order are to be individually acceptance stamped by appropriate supplier personnel in accordance with systems described in Boeing form X-23784.

QR # QC3080 – Checklist Compliance

New 5/13/02

Revised 4/26/06

Supplier is to complete the latest revision of Boeing Checklist Form #57767 prior to each shipment in order to ensure compliance with applicable GKN contract requirements. If supplier fails to comply with any such requirement, GKN may back bill the supplier \$200 per occurrence to correct the non-compliance.

QR # QC3085 – Comanche Program – Flight Safety (Helicopter Only)

New 04/18/03

Obsolete 4/26/06

QR # QC3090 – Packaging, Marking and Shipping (Boeing Helicopter)

New 05/13/02

Obsolete: 6/1/16

QR # QC4000 – Approved Process Sources (Comanche)

New 10/11/02

Obsolete 4/26/06

QR # QC4001 – Raw Material Test Results (Comanche)

New 10/11/02

Obsolete 4/26/06

MI 7.4-18 – Quality Requirements, Rev P

QR # QC4002 – Non-Destructive Testing (NDT) Certification (Comanche)

New 10/11/02

Obsolete 4/26/06

QR # QC4003 – Compliance with MIL-I-45208A or Equivalent (Comanche)

New 10/11/02

Obsolete – 05/12/04

QR # QC5000 – Use of Chemtronics NMR (F-22)

New 10/11/02

Revised – 4/26/06

Obsolete: 6/1/16

QR # QC5001 – Software Control in accordance with DOD-STD-2168 (Boeing F-22)

New 10/11/02

Obsolete: 6/1/16

QR # QC5002 – Processor Certification Requirements (Boeing F-22)

New 10/11/02

Obsolete: 6/1/16

QR # QC5003 – Manufacturing Plan Approval (Boeing F-22)

New 10/11/02

Obsolete: 6/1/16

QR # QC5004 – Boeing F-22 Processor Approval per 5PD90505P

New 10/11/02

Obsolete: 6/1/16

QR # QC5005 – Mill Test Reports (Boeing F-22)

New 10/11/02

Obsolete: 6/1/16

QR # QC5006 – Variable Inspection Data Requirements (F-22)

New 10/11/02

Obsolete: 6/1/16

QR # QC5007 – Compliance with Engineering Requirements (Boeing F-22)

New - 10/11/02

Obsolete: 6/1/16

MI 7.4-18 – Quality Requirements, Rev P

QR # QC5008 – Subject to Chem-tronics Source Inspection (F-22)

New- 10/11/02

Obsolete: 6/1/16

QR # QC5009 – Supplier Certificate of Conformance Requirements (Boeing F-22)

New - 10/11/02

Obsolete: 6/1/16

QR # QC5100 – Nonconforming Material Control (Northrop Grumman)

New - 08/26/04

Revised – 12/04/08

When invoked, this Quality Requirement supersedes Quality Requirement # QC2081A.

Nonconforming material must be identified, documented, evaluated, segregated, and dispositioned to prevent its unintended release or use. The supplier's disposition authority of nonconformances is limited to rework to specification, return to supplier and scrap. These terms are defined as follows:

1. **Rework** - Restore material to specification compliance in accordance with required process(s) and addressed by governing process specification(s). Parts subject to subsequent processing not authorized by specification shall be submitted to GKN for disposition. Specific rework instructions shall be provided with rework dispositions.
2. **Return To Supplier** - Return of subcontractor product found to be discrepant for subsequent rework or replacement.
3. **Scrap** - Permanent removal from production and destruction of product found to be unfit for use. Scrapped product shall be controlled until destroyed.
4. **MRB** - If product cannot be dispositioned as listed above, it shall be submitted to GKN Aerospace – St. Louis for Material Review Board (MRB) action using Form MI 7.4-16(b) – Supplier Nonconformance Record. Any nonconformance-related attachments should be enclosed on Form MI 8.1-11 (e) or Form MI 8.1-11 (f) and submitted along with MI 7.4-16(b). The GKN Buyer will assign a GKN External Nonconformance Number and provide it to the supplier to revise Forms MI 7.4-16(b), MI 8.1-11 (e) or MI 8.1-11 (f) and to include on Form MI 7.4-16 (d) – Deviated Supplied Parts Cover Sheet. If GKN elects to bring the nonconforming part in, the supplier shall complete MI 7.4-16 (d) and submit it to GKN along with the nonconforming part, the completed MI 7.4-16(b) and the GKN External Nonconformance document. In addition, all supplier Certificates of Conformance shall note the GKN External Nonconformance Number. NOTE: The supplier is not authorized to ship the product to GKN unless explicit written direction has been provided by the GKN Buyer.

The supplier shall retrieve the latest revisions of the documents above from their GKN Buyer or from the GKN Supplier Portal at <http://www.gkn.com/aerospace/supplier-info/st-louis/Pages/Quality-Information.aspx>.

MI 7.4-18 – Quality Requirements, Rev P

QR # QC5101 – Quality Record Retention (Northrop Grumman)

New - 08/26/04

When invoked, this Quality Requirement supersedes Quality Requirements #QC2011. The supplier shall maintain quality records in accordance with the applicable quality system standard (i.e. – ISO 9001, AS/EN9100). The records shall be retained for a period of not less than ten (10) years from completion of purchase order (unless otherwise stated below). The supplier must impose this requirement on their sub-tiers.

Records shall include, but are not limited to:

- Evidence of inspection to assure adherence to applicable drawings or specifications and revisions
- First Article Inspection Report – The FAI shall be retained as a quality record for a minimum of three (3) years from completion of the last purchase order for that part number with the same revision level.
- Test reports
- Periodic inspection and control of inspection media
- Records to indicate control of special tooling and special test equipment
- Test data records of all qualification and acceptance test performed
- Certification of personnel as required by specification and/or contract
- Raw material and process certifications
- Material review reports

QR # QC5102 – Shipping Documentation Requirements (Northrop Grumman)

New - 08/26/04

Revised – 2/16/15

The supplier shall maintain quality records in accordance with the applicable quality system.

1) Packing Slips - Supplier shall provide a packing sheet or attachments for each separate shipment with the following minimum requirements:

- a) Supplier's company name and address.
- b) Purchase order number, line item(s) and part numbers.
- c) GKN dispositioned nonconformance document number(s), as applicable.
- d) Interchangeable and Replaceable (I&R) designated control numbers.
- e) Required parts traceability forms, as applicable.

Evidence of GKN source acceptance if purchase order required GKN source surveillance.

2) Certificate of Conformance - Supplier shall comply with GKN Quality Requirement #QC2040 – “Certificates of Conformance”. All fabricated aluminum parts require 100% conductivity inspection. Use the QOS-0021, Seller Requirements for Temper Inspection by Electrical Measurement and/or Hardness Measurement (http://www.northropgrumman.com/suppliers/OASISDocuments/QOS-0021_Seller_Requirements_for_Temper_Inspection_by_Electrical_Measurement_or_Hardness_Measurement_Dated_7_31_12.pdf) to determine the required conductivity range. When a supplier is contracted to build and deliver a given part number to a specific engineering revision level, an engineering document that is either equal to or later in revision level is an acceptable means of performing product acceptance. A later revision of an engineering drawing includes

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incorporation of revisions that would have been issued as addendums (Engineering Orders, Engineering Change Notices, etc) to the prior level change and are thereby incorporated in the later revision. Unless otherwise specified, the supplier shall work to the latest revision military process specifications referenced in the purchase order or the engineering documents.

- 3) **Suppliers of Age-Sensitive Materials** - Provide original manufacturing/cure date, lot number(s), expiration date or length of shelf life (if indefinite, so state). In addition, forward any special storage/handling instructions. Supplier is responsible to determine if acceptance test report submittal is required in accordance with applicable material specification. The supplier shall physically identify the shelf life expiration date on the deliverable product or the unit packaging according to the applicable standard. Elastomeric material with “No Shelf Life” requirement or “Unlimited Shelf Life” shall be marked as such
- 4) **Tooling – Suppliers of Special Tooling or Special Test Equipment** - In addition to sections “A & B” above, record the tool number, tool symbol, tool serial number (including the multiple number, as applicable), and assure a Northrop Grumman source surveillance stamp has been applied (see QR# QC5108 for additional tooling-related requirements).
- 5) **Rework/Repair/Replacement/Modified Items** - Supplier’s Certification of Conformance and/or packing sheet document shall reflect the following requirements for rework, replacement, repair, modification, items returned to supplier, or work performed by supplier on-site at GKN’s facility.
 - a) The item(s) have been reworked, repaired, replaced, or modified (as applicable), in accordance with respective nonconformance documents or purchase order.
 - b) The item(s) meet the requirements of the engineering document(s).
 - c) The original configuration and qualification status of the item(s) remains in effect (as applicable).
 - d) All applicable nonconformance document numbers or other references to insure traceability.
 - e) **Note:** Discrepant material **shall not** be shipped to GKN or GKN’s customer without prior written approval from GKN Procurement and Material Review Board (MRB) Engineering.
- 6) **Qualification Certification** - When the drawing, procurement specification and/or purchase order requires deliverable items to be “Qualified”, suppliers shall certify that materials, parts, assemblies and/or related contract “Data Items” have been approved and all components of a deliverable item have been inspected and/or tested to applicable Acceptance Test Procedures (ATP) and/or specification/control drawings (GKN, Northrop Grumman, and supplier originated). In addition, to sections “A and B” above, certification shall indicate revision level of engineering drawings, specifications, and applicable design/specification changes as stated in purchase order. Only authorized GKN Engineering and Procurement written consent shall allow end items to be delivered prior to completion of qualification testing.
- 7) **Material Certifications** - Supplier shall maintain a copy of all supplier procured raw material certifications, which must be readily retrievable and shall include material specification, description, alloy and condition. The supplier shall maintain the mill certification for procured metallic material that shall include physical properties, chemical analysis and lot number(s). Metallic raw material distributors (ref: SQAR Code “A”) shall include a copy of the original mill’s certification with the shipment of deliverable material. Supplier’s material and sub-tier supplier certifications and test results shall be made available upon request.

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- 8) Process Certifications** - Supplier shall obtain and furnish process certifications for all subcontracted processes with each shipment to GKN. Certifications shall state that parts have been processed/tested in accordance with Northrop Grumman Corporation, Military Aircraft Systems Division (NGMASD) approved procedures. This includes sub-tier supplier process certifications. Attach one (1) copy of the process certifications to the material involved and one copy to the shipping document(s) with each shipment. Process certification(s) shall identify the processor, part number, purchase order number, process specification number, identification of process method used, acceptance criteria document and the applicable quality control standard (CQS). Certifications must contain the document revisions. Additionally, suppliers shall maintain copies of all subcontracted special processes. Supplier shall also obtain and maintain sub-tier supplier process certifications. Supplier's process and sub-tier supplier processor certifications and test results shall be made available upon request.
- 9) Distributors of Standard Parts/Hardware** - Standard and purchase parts distributors shall comply with the requirements of Northrop Grumman's Quality Assurance Test Procedure (QATP). Suppliers may obtain this document from the Northrop Grumman Oasis website or they may request a copy from their GKN buyer. <https://oasis.northgrum.com/>

QR # QC5103 – Nondestructive Test (NDT) Submittal Requirements (Northrop Grumman) New - 08/26/04

Supplier shall review the purchase order and associated drawings/drawing notes and related documents to determine if NDT is required. Submittal of NDT general procedures and part-specific techniques to GKN is required prior to production testing. Guidelines for the minimum content of general procedures/techniques are provided in the respective NDT process specification. After initial approval, any changes to subject documents must be resubmitted to GKN for approval. An EO change to a specification does not require resubmittal. A specification revision change does require submittal of a revised procedure/technique or letter of compliance. Suppliers using outside sources for NDT shall ensure that the selected NDT sub-tier has GKN & Northrop Grumman approval for the NDT procedure/technique used. An Approved Nondestructive Testing procedure/technique list is available on the Northrop Grumman Oasis website under Approved Processors.

<https://oasis.northgrum.com/>

NDT technique shall be submitted to GKN in accordance with applicable specifications. In addition, suppliers will include with each shipment a certificate that lists the NDT performed. A record of the procedures or techniques used and actual results will remain on file for at least 10 years after shipment to GKN and will be furnished to GKN upon request. These records must include the inspector's signature or stamp and their NDT Certification Level.

QR # QC5104 – Control and Use of Digital Datasets (Northrop Grumman)

New - 08/26/04

When digital datasets are required to manufacture product, the supplier shall comply with the "SQAR Supplement for the Use and Control of Digital Datasets" located in the Quality Requirements section of the Northrop Grumman Oasis website. <https://oasis.northgrum.com/>

QR # QC5105 – Supplier Sub-tier Control (Northrop Grumman)

New - 08/26/04

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Supplier is responsible for ensuring all items procured from its subcontractors conform to all requirements of the GKN purchase order. Supplier shall ensure all applicable provisions of this document are flowed down to its subcontractors. The sub-tier Supplier Quality system shall be compliant to the latest revision of either ISO9001 or AS9100, except FAA Repair Stations. All sub-tier suppliers are also required to utilize AS9102 for their first article inspection (See Quality Requirement #QC2098 – First Article Inspection (AS9102)).

QR # QC5106 – Northrop Grumman Special Process Requirements

New - 08/26/04

When special processes listed in the Northrop Grumman “Approved Special Processors List” (ASPL), are required by drawing, specification, or purchase order, the supplier shall ensure that the processing source performing the work, including the supplier, is listed on the ASPL for that process prior to processing each batch of hardware. Special Processors are required to be accredited by the National Aerospace and Defense Contractors Accreditation Program (NADCAP). A processor’s approval will be determined based on the Northrop Grumman review of the latest NADCAP audit report for those processors with valid NADCAP approvals. For processors without a valid NADCAP approval, the affected processors are encouraged to get the NADCAP accreditation as soon as possible. Northrop Grumman has subscribed to NADCAP for the following process categories with a full transition to NADCAP by August 2003:

- Nondestructive Testing
- Heat Treating
- Material Testing Laboratories
- Chemical Processes
- Coatings
- Welding

When the Processor requires the use of outside sources for salt spray, tensile testing and solution analysis, NADCAP accredited laboratories shall be used as of June 2004. The NADCAP approved Materials Test Laboratory list can be found on the PRI web site: <http://www.pri.sae.org/> under Qualified Manufacturer List (QML) or eAuditnet. Northrop Grumman reserves the right to validate NADCAP compliances to any processes that are unique to Northrop Grumman or outside the scope of normal industry practice and/or NADCAP general audit practice. This requirement also applies to the first-tier suppliers with internal process capabilities. In addition, if the supplier utilizes any external special process sources, this requirement must be flowed down to the processing sources as soon as possible so as to avoid any problem during the transition in September 2003. All costs associated with NADCAP accreditation are to be borne by the processor.

The Performance Review Institute (PRI), a nonprofit affiliate of the Society of Automotive Engineers (SAE), must perform NADCAP accreditation audits. Any detail information regarding NADCAP accreditation process including the audit schedule can be obtained from PRI at (724) 772-1616 or from the PRI Website: <http://www.pri.sae.org/>

When processes listed in another prime aerospace company’s Approved Processor List, (i.e., Boeing D1-4426, Lockheed Martin QCS-001, etc.), are required by drawing, another specification, or purchase order, the supplier shall ensure that the processing source for these processes, including those performed in house by the supplier, are approved prior to any processing of hardware.

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The ASPL, D1-4426 and QCS-001 are available on OASIS: <https://oasis.northgrum.com/>

The processor may use a later revision of a process specification shown on OASIS, provided the following requirements are met:

- 1) There are no Northrop Grumman-initiated engineering orders associated with the process specification that the author of the specification has not incorporated in the latest revision.
- 2) There is no cost or schedule impact to deliverable hardware under contract. If an impact does exist as a result of using a later process specification revision than that shown on OASIS, the supplier shall contact the buyer for disposition instructions.

Note: Suppliers with Design authority may approve their own sub tier process source(s) to their process specifications. This authority does not extend to other Prime's process specifications, such as Boeing or Lockheed Martin. However, they are encouraged to subscribe to NADCAP by August 2003. Subcontracted processes of components of Supplier design must be performed by supplier-approved facilities whose capabilities and performance are supported by objective evidence of control such as: surveys and/or test results. A listing of all facilities being used must be available for review by Northrop Grumman which reserves the right of disapproval of those facilities not considered satisfactory. The suppliers shall not substitute their own process specification for the Northrop Grumman or customer process specification without prior written approval from Northrop Grumman Engineering.

The ASPL is organized by process type rather than by process specification. This listing of the ASPL indicates a Northrop Grumman approval of processor's capability to perform the process as required by the process specification.

Listing in the ASPL does not assure or imply that the work performed by the ASPL processor is acceptable, nor does it compel the listed processor to accept the work. It is the responsibility of the Supplier and/or the processor to review, perform, inspect and certify the processes specification as required by the purchase order. Since many specifications call out multiple alloys, grades, types, classifications and conditions for materials, it is also the supplier and/or the processor's responsibility to assure that you are approved for and capable of performing requested processing prior to any actual processing. Any departure from specification requirement requires the prior written approval of the Northrop Grumman engineering group responsible for the specification. The ASPL processors tier shall also comply with the Northrop Grumman Program unique requirements such as submission of test coupon, written approval of the processor's detail procedure, use of specific chemicals and/or concentration, and witnessing of first part processing and etc., when required by the process specification.

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QR # QC5107 – Manufacturing Plan Submittals for Critical and Designated Parts (Northrop Grumman)

New - 08/26/04

Parts designated or described as Fracture Critical, Fracture Critical Traceable, Fatigue Critical, Durability Critical, Maintenance Critical, or F-35 Critical Parts requiring traceability by engineering drawings, specifications or purchase order configuration, require submittal of the manufacturing plan to GKN at least forty five (45) days prior to start of production. The manufacturing plan shall contain sequential fabrication, processing, processor name, and inspection steps, in the order required by the applicable process specification(s) and/or engineering drawing(s). Upon approval of supplier's manufacturing plan, the supplier shall control all manufacturing, processing, testing and inspections as stated in the approved plan. No deviations, including the selection of supplier's sub-tier suppliers/processors, is permitted without GKN prior knowledge and written authorization. Manufacturing of product is not permitted until supplier has received GKN approvals.

QR # QC5108 – Tooling Requirements (Northrop Grumman)

New - 08/26/04

The Northrop Grumman Supplier Tooling Manual delineates requirements for suppliers who have purchase orders that require manufacture, rework or use of Special Tooling (ST) and Special Test Equipment (STE). These requirements are applicable to all Northrop Grumman ST and STE fabricated and/or used in the manufacture of deliverable end items, unless specifically stated otherwise on the purchase order. Suppliers shall flow down requirements identified in these manuals to their sub-tier suppliers that fabricate or design tooling on their behalf.

The Northrop Grumman Supplier Tooling Manual can be accessed on the Northrop Grumman Oasis website. <https://oasis.northgrum.com/>

Copies of other manuals/documents can be obtained by contacting the buyer.

At a minimum, Special Tooling (supplier manufactured or Northrop Grumman furnished) used as a media of inspection must be delineated in the supplier's manufacturing plan at the applicable operation/sequence where the inspection occurs. Inspection media tooling must be controlled as part of the supplier's "Periodic or Calibration" system prior to use in production. Periodic tool inspection detailed requirements are covered in the Northrop Grumman Supplier Tooling Manual.

QR # QC5109 – Northrop Grumman Supplier Quality Assurance Requirements (SQAR) (Northrop Grumman)

New - 09/16/15

Work to be accomplished in performance of this purchase order is directly related to a Northrop Grumman purchase order and must be accomplished in accordance with processes specified on this purchase order and Northrop Grumman SQAR (latest revision). Further information can be found at <https://oasis.northgrum.com/contract/qualdocs.htm>

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QR # QC6000 – HTF7000-Specific Quality Requirements

New - 4/18/03

Revised – 11/28/12

Obsolete: 6/1/16

QC6500 – Work Related to Pratt and Whitney Purchase Order

New – 2/13/07

Work to be accomplished in performance of this purchase order is directly related to a Pratt and Whitney purchase order and must be accomplished in accordance with processes specified on this purchase order and Pratt and Whitney specification PWQA 6088 (latest revision). Further information can be found at <http://www2.pratt-whitney.com/procurement/tphome.htm>.

QC7000 – Work Related to Lockheed Martin (Sikorsky CH53K) Purchase Order

New – 2/13/07

Revised – 10/06/17

Work to be accomplished in performance of this purchase order is directly related to a Lockheed Martin Company member company. All work must be accomplished in accordance with processes specified on this purchase order and Sikorsky specification SSQR-01 (latest revision). Further information can requested from Sikorsky Prime Supplier (GKN Buyer or Quality Engineer).

QC7010 - Calibration Quality Requirements

New – 05/30/08

Seller-Calibration Vendor

Buyer-GKN Aerospace

General calibration quality requirements-

Calibration authorities shall be ISO 17025 accredited.

Calibration services provided shall be certified in accordance with AS9100, ISO 10012, ISO 17025, and/or ANSI Z540 where applicable.

Written documentation including the calibration procedure and all calibration data must be provided at the time of certification and maintained by the seller for a period of 3 years.

Written documentation, including the stickers applied to the gage or its enclosure, must comply with ISO 10012, ISO 17025, or ANSI Z540.

All measurements and standards must be NIST traceable.

The seller shall provide qualified personnel and equipment to conduct calibration.

If required, the seller may be subject to process audits by the buyer. Auditors may include buyer's customer personnel.

Out of tolerance conditions- Equipment failing calibration criteria in the as found or as calibrated condition shall be documented by the seller as failing as found or as calibrated condition calibration.

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QC7020 – Wire Spool Identification Requirements

New – 06/05/08

Wire purchased for use in chemical processing areas will be clearly identified with material type and alloy. Each individual wire spool shall contain a material identification label with the following information:

Manufacturer

Part number

Material type / alloy

Purchase Order number

QC7030 – GKN Sub-Tier Supplier Material Traceability Requirements

New – 07/11/08

Revised – 10/06/17

All suppliers of parts produced from raw material purchased by the supplier or sub tier shall comply with traceability requirements consistent with AS-9100. At a minimum, supplier must be able to trace special process(es) as noted in Approved Source List, and where the raw material is serialized, (such as forgings, castings, flight safety, etc.). Part serialization traceability shall also be maintained. This information shall be traceable from the product identification backwards through the supplier's manufacturing documentation, to its originating manufacturer, to include supplier's sub-tier supplier(s) if applicable.

QC7040 – Control of Records (Sikorsky)

New – 08/08/08

(1) Electronic imaging/microfilming of records in lieu of storing actual inspection records is permissible. All electronic records must be controlled, retained, and retrievable per the same requirements identified for hard copy records. For electronic records that are transferred from computer files, the storage media must be capable of maintaining the data integrity for the full retention period.

Examples of Quality Records to be retained are, but not limited to:

- Deliverable and nondeliverable software verification & validation
- First article inspection reports
- In process / final inspection & test records
- Training records
- Manufacturing / fabrication records (e.g., planning sheets, routers, etc.,)
- Nonconforming material disposition
- Procurement documents (supplier placed orders)
- Process control records (used as acceptance criteria)
- Radiographs, technique sheets and related acceptance reports
- Receiving inspection Records (e.g., test reports and material certifications, etc.,)

(2) Retain Quality Management System (QMS) records as identified per AS9100. The following identified quality records shall be maintained for the minimum retention periods specified below.

- 40 years from time of manufacture for:

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Flight safety, Space Shuttle fuel cells, critical / major rotor parts (i.e., turbine and compressor disks, hubs, shafts, free turbine couplings and turbine disk side plates), serialized major engine (cast / fabricated) cases (i.e., inlet, fan, compressor, intermediate, diffuser, combustion, turbine and exhaust cases) and main shaft bearing supports, which are not integral to a major case.

- 30 years for Manned Space Program Hardware
- 10 years for all other parts except off-the-shelf industry standard parts.
- 4 years for off-the-shelf / industry standard parts (e.g., AN, AS, MS, JAN, etc.).

(3) Radiographs: The Supplier shall retain radiographs.

- 40 Years for:

Flight safety, Critical / major rotor parts (i.e., turbine and compressor disks, hubs, shafts, free turbine couplings and turbine disk side plates), Space Shuttle fuel cells as well as serialized major engine (cast / fabricated) cases, (i.e., inlet fan, compressor, intermediate, diffuser, combustion, turbine and exhaust cases), and main shaft bearing supports which are not integral to a major case and engine components traceable by Engineering Drawing / Quality Assurance Data required serial numbers.

- 10 Years for:

Castings or parts where the purchase order, engineering drawing or specifications require serial number traceability. Castings or parts where the purchase order, engineering drawing or specifications do not require serial number traceability, shall be retained only if no other inspection record is retained that documents completion and final acceptance of radiographic inspection.

- 5 Years for:

Military hardware – turbine airfoil (blades) casting radiographs for initial casting quality.
Military hardware – Radiographs of airfoils for the presence of foreign material need not be retained provided an inspection record is retained that documents completion and final acceptance of radiographic inspection.

QC7050 – Approved Source List and Standard Parts Index (Sikorsky)

New – 08/08/08

Revised - 10/02/09

Supplier / Sub-Tier Supplier must only use approved sub-tier suppliers listed in the latest version of the Sikorsky Aircraft Approved Source List (ASL) for Special Processes and Laboratories.

Flight Safety Parts: Supplier / Sub-Tier Supplier must only use approved sub-tier suppliers listed in the latest version of the Sikorsky Aircraft SS9211 Flight Safety Parts Source Approval, Quality and Test Requirements.

Supplier / Sub-Tier Supplier must only use approved purchased Common-Off-The-Shelf-Items (COTSI) listed in the latest version of Sikorsky Aircraft Standard Parts Index.

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QC7060 - Supplier Nonconformance/Corrective Actions (Sikorsky)

New – 08/08/08

Revised – 10/06/2017

Sikorsky Sub-Supplier requiring Material Review Board (MRB) disposition actions for nonconforming material must submit to Sikorsky Prime Supplier Buyer (GKN Saint Louis) on non-conformance record form (MI 7.4-16 (B)). Every non-conformance record form filled out must have objective evidence(s) that corrective action is being implemented. Sikorsky Prime Supplier Buyer shall submit to Sikorsky Prime Supplier Material Review Board for disposition. Each disposition will be sent back to Sikorsky Sub-Supplier for necessary action. Sikorsky approval may be needed in some cases as deemed necessary by Sikorsky Prime Supplier per SSQR-01 Supporting Documentation Appendix A (Non-Conforming Material Procedure).

QC7070 – Aerospace Supplier Quality Requirements (Sikorsky)

New – 08/08/08

Revised – 10/6/2017

Suppliers of Sikorsky Aircraft product must follow the requirements as outlined in the current revisions of the Sikorsky Aircraft Aerospace Supplier Quality Requirements of all relevant SSQR documents listed herein:

| | |
|-----------|--|
| SSQR-01 | Supplier Quality System Requirements |
| SSQR-01 | Supporting Documentation – Main Text |
| SSQR-01 | Appendix A - Non-Conforming Material |
| SSQR-01 | Appendix B - Gaging Tolerancing |
| SSQR-01 | Appendix C - Designated Quality Representative (DQR) |
| SSQR-01 | Appendix D - Subtier Management |
| SSQR-01 | Appendix E - Process Certification |
| SSQR-01 | Appendix F - PPAP |
| SSQR-15.1 | FOD Handling Packaging |
| SSQR-20.1 | Sampling |
| SS7777 | Sikorsky Aircraft Material and Process Specification Index provides all revision levels, deviations, and amendments for all specifications related to the procurement of this PO line item. Each material and process specification and revision level must be included on all applicable documents, including certificate of conformance. |

ALL required documents can be obtained through Sikorsky Prime Supplier Buyer or Quality Representative.

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QC7080 – AS9102 First Article Inspection and Inspection Check Lists (Sikorsky)

New – 10/02/09

Revised – 10/06/17

First Article Inspection:

Sub-Tier Supplier of Sikorsky CH53K products must perform, retain records thereof and submit to Sikorsky Prime Supplier (GKN Saint Louis), completed AS9102 First Article Inspection Reports for all initial representative first articles of production product. Only approved AS9102 First Article Inspection Reports from Sikorsky Prime Supplier (GKN Saint Louis) can be used. Forms one (1), two (2) and three (3) shall be used in-accordance-with the following documents:

AS9102 First Article Inspection

GKN GKQP-008, First Article Build Plans & AS9102 First Article Inspections

GKN SAC CH53K Program Sub-Contract Supplier Instructions for Completing the SAC AS9102 Forms

The organization of the first article packets must be submitted in accordance with Q/PDS No. SH-094-001 with all the required material and process certifications as well as traceability from the material and process certifications back to the supplier / sub-tier supplier's own certificate of conformance.

GKN requires the following paper work with each lot of parts:

- Certificate of Conformance
- Original Certifications (Material(s), special process(es), etc)
- FAI Submittal Checklist
- CMM Report, cloud points or Bubble Drawing for characters that require it
- FAI (for one part)
- ICL (for all other parts)
- Data Sheet
- QMAP
- Photo of ID
- AND Anything else to help the part/lot pass GKN inspection and Sikorsky Inspection.

Inspection Check Lists:

Sub-Tier Supplier of Sikorsky Aircraft product must perform, retain records thereof and submit to GKN Aerospace approved AS9102 First Article Inspection Reports from Sikorsky Prime Supplier (GKN Saint Louis) can be used. Forms two (2) and three (3)) shall be used in-accordance-with the following documents:

AS9102 First Article Inspection

GKN GKQP-008, First Article Build Plans & AS9102 First Article Inspections

GKN SAC CH53K Program Sub-Contract Supplier Instructions for Completing the SAC AS9102 Forms

GKN requires the following paper work with each lot of parts:

- Certificate of Conformance
- Original Certifications (Material(s), special process(es), etc)
- FAI Submittal Checklist

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- CMM Report, cloud points or Bubble Drawing for characters that require it
- ICL (for all parts)
- Data Sheet
- QMAP
- AND Anything else to help the part/lot pass GKN inspection and Sikorsky Inspection.

QC7090 – Critical Parts Traceability and / or Serialization Requirements (Sikorsky)

New – 10/02/09

This part includes a requirement for inclusion of critical traceability and / or serialization data in accordance with SS9070, Serial Numbering and Trademark Identification of Details, Assemblies and Equipment.

QC7091 – GIDEP Program

New – 12/1/11

All suppliers are required to implement a GIDEP program within their facility. Government Industry Data Exchange Program (GIDEP) Weekly Summaries and Parts Lists will be reviewed through GIDEP notification hyperlinks for Parts List, Delimited List, R&M Summary, Engineering Summary, Failure Summary, Suspect Counterfeit Material Summary, Metrology Summary and the Product Information Summary on a weekly basis. In the event a GIDEP notification indicates a supplied material may be affected, suppliers will check all stock for applicable dates and quarantine, if necessary, until resolution is found. Suppliers will also notify GKN of any applicable product.

QC8010 – Approved Processor Source List (Bell Helicopter)

New – 05/03/13

Supplier/Sub-Tier Supplier must only use approved sub-tier suppliers in the latest version of QPS 101 Section III BHT Approved Process Sources.

Listing on the Approved Processor List means that a processor has been found capable of performing the BHT process involved. It is both the supplier's and the processor's responsibility to impose BHT process requirements and to exercise adequate controls to assure compliance.

QC8020 – Control of Records (Bell Helicopter)

New – 05/03/13

Records required by applicable specification and objective evidence of compliance with requirements, including records of inspection, tests, nonconforming material and corrective action, engineering change incorporation, supplier/processor surveys/approvals, and other Quality Assurance activities, shall be maintained and made available for review upon request. Unless otherwise specified, records shall be maintained by the supplier/processor for a minimum of five (5) years after completion of the purchase order.

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Manufacturing and all quality records for controlled records containing “significant” or “critical” characteristics per QPS 300 are to be maintained for 10 years from completion of applicable contract purchase order and be available for review.

QC8030 – First Article Inspection (Bell Helicopter)

New – 05/03/13

Supplier/Sub-Tier Supplier of Bell Helicopter Textron product must perform, retain records thereof and submit to GKN Aerospace, completed AS9102 First Article Inspection Reports for all initial representative first articles of production product. In addition to AS9102 requirements, a FAI is required for configuration changes and lapses of shipments greater than two (2) years in which case if a lapse in shipment occurs then a copy of the most recent F.A.I. will suffice.

Supplier FAI reports for BHT must comply with the format of AS9102, and to BHT additional requirements for Conditional Required fields within the FAI forms as follows:

- Technical Data Package – form 1, Field 5
- Part Physical Change – Form 1, Field 5
- Date of Manufacture - Form 1, Field 5
- Manufacture Lot Number (when no serial number) – Form 1, Field 9
- Drawing parts list revision level (in addition to drawing revision level) – Form 1, Field 7

QC8040 – Aerospace Supplier Quality Requirements

New – 05/03/13

Supplier of Bell Helicopter Textron product must follow the requirements as outlined in the current revisions of the Quality Procurement Specifications in addition to standard purchase order, special manufacturing, drawing and/or model and Bell process specification requirements.

QC8100 – Mill Certification

New – 10/5/16

For raw materials purchased in support of delivered product, supplier shall furnish one copy of mill certification, issued and signed by the producing mill, with each shipment. Mill certification shall contain the following:

“Conformance with applicable material specification as specified in the purchase order, material description, alloy and condition, physical properties, chemical analysis and lot number.”

QC8110 – GKN Approval of FAI Prior to Production

New – 10/5/16

Supplier must submit, and GKN must approve, a copy of an AS9102-compliant First Article Template prior to the start of production. Template will identify all characteristics to be reviewed on the First Article part.