PURCHASE ORDER APPENDIX QCI-06-063 (ARPRO 967)
SUPPLIER PRODUCT ASSURANCE REQUIREMENTS

I. PURPOSE

This document establishes requirements applicable to items ordered under the Purchase Order of which this form, ARPRO 967 is a part, to assure that such items are of the required quality and reliability. It contains general requirements for product assurance, which are applicable unless expressly excluded in the Purchase Order, and Special Product Assurance Requirements (SPARS) which apply as designated.

II. GENERAL REQUIREMENTS

Unless otherwise specified in the purchase order, the following general requirements apply to this purchase order:

A. PROHIBITED PRACTICES

1. Unauthorized Repairs: Supplier may not repair any part that is damaged or found to be faulty during fabrication without the express written permission of the Arrowhead. Defects in castings or forgings shall not be repaired by any method unless authorized by the Arrowhead in writing.

2. Unauthorized Material Substitution: Unauthorized material substitutions are not permitted on Buyer's Parts. 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.

3. Counterfeit Parts:

   a) Prevent the use of counterfeit parts.

   b) Supplier shall not furnish to Buyer any Parts under this Contract that are "Counterfeit Parts," defined as parts or separately-identifiable items or components of parts that: (i) are an unauthorized copy or substitute of an Original Equipment Manufacturer or Original Component Manufacturer (collectively, "OEM") item; (ii) are not traceable to an OEM sufficient to ensure authenticity in OEM design and manufacture; (iii) do not contain proper external or internal materials or components required by the OEM or are not constructed in accordance with OEM design; (iv) have been re-worked, re-marked, re-labeled, repaired, refurbished, or otherwise modified from OEM design but not disclosed as such or are represented as OEM authentic or new; or (v) have not passed successfully all OEM required testing, verification, screening, and quality control processes.

   c) Supplier shall implement an appropriate strategy to ensure that Parts furnished to Buyer under this Contract are not Counterfeit Parts. Supplier's strategy shall include, but is not limited to, the direct procurement of items from OEMs or authorized suppliers, conducting approved testing or inspection to ensure the authenticity of items, and, when items are to be procured from non-authorized suppliers, obtaining from such non-authorized suppliers appropriate certificates of conformance that provide one or more of the following: (i) the OEM's original certificate of conformance for the item; (ii) sufficient records providing unbroken supply chain traceability to the OEM; or (iii) test and inspection records demonstrating the item's authenticity.

   d) Counterfeit Parts delivered or furnished to Buyer under this Contract are deemed nonconforming. If Supplier becomes aware or suspects that it has furnished Counterfeit Parts to Buyer under this Contract, Supplier promptly shall notify Buyer and replace, at Supplier's expense, such Counterfeit Parts with OEM or Buyer-approved Parts that conform to the requirements of this Contract. Supplier shall be liable for all costs related to the replacement of Counterfeit Parts and any testing or validation necessitated by the installation of authentic Parts after Counterfeit Parts have been replaced. The remedies contained in this article are in addition to any remedies Buyer may have at law, equity, or under other provisions of this Contract.

d. Supplier bears responsibility for procuring authentic Parts or items from its subcontractors and shall ensure that all such subcontractors comply with the requirements of this article.

4. GIDEP (Government - Industry Data Exchange Program) – Supplier shall notify Arrowhead Products in writing if a GIDEP Alert is received and the alert affects product delivered or in transit to Arrowhead.

5. Change in Approved Processes, Materials or Procedures: Supplier shall not change any process, material and/or procedure without prior written approval from Arrowhead.

6. Improper Re-submittal: Articles rejected by the Arrowhead and subsequently resubmitted to the Arrowhead shall be clearly and properly identified as resubmitted articles.

7. Notification of Owner/Management/Facility Changes:
Supplier shall notify Arrowhead Products of changes to processes, products, or services, including changes of their external providers (suppliers) or location of manufacture, and obtain Arrowhead Products' approval.

8. Flow down of Requirements:
Supplier shall flow down to external providers (suppliers) applicable requirements including customer requirements.

9. Test Specimens:

Supplier shall provide test specimens for design approval, inspection/verification, investigation, or auditing.

10. Employee Awareness

Supplier shall ensure that employees are aware of:
- their contribution to product or service conformity;
- their contribution to product safety;
- the importance of ethical behavior.

B. RESPONSIBILITY FOR CONFORMANCE

Neither surveillance, inspection and/or tests made by the Arrowhead, or his representatives at either the Supplier's or Arrowhead's facility, nor the Supplier's compliance with all applicable Product Assurance Requirements shall relieve the Supplier of the responsibility to furnish items which conform to the requirements of the Purchase Order. The performance of the supplier shall be monitored by Arrowhead Products.

C. DOCUMENTATION

Documentation shall be verified for fulfillment of all Supplier Product Assurance Requirements specified by P.O. or Offsite Work Order (OWO) for outside processing; including proper certifications, test reports, data sheets, first article inspection reports, identification, etc. All reports shall contain accurate and correct information. If documentation errors are detected, a corrective action may be generated and hardware may either be rejected or returned.

D. CERTIFICATE OF COMPLIANCE AUDIT

Certifications furnished under the terms of the purchase order shall be supported by test records and data and are subject to audit by Arrowhead Products.

E. CORRECTIVE ACTION REQUESTS

When a quality problem exists, Arrowhead Products may request corrective action from the Supplier. Such requests require timely responses and should include the following information: Analysis of the cause of the problem, statement of the action taken, and the effectivity date of the action. Requests for extension of due dates shall be directed to the Arrowhead Products buyer.

F. RIGHT OF ACCESS

Supplier shall allow right of access to Arrowhead Products, its customers, and regulatory authorities to the applicable areas of facilities and to applicable documented information, at any level of the supply chain.

G. PHYSICAL INVENTORY OF TOOLING

A periodic (18 Month Interval) physical inventory of tooling will be requested by Arrowhead Products' Tooling & Property Coordinator. All Suppliers that receive this request must perform, record, and disclose their physical tooling inventory results in the time allotted by the Tooling & Property Coordinator.

H. METAL/ RAW MATERIAL REQUIREMENTS

For all purchased parts containing metallic raw material, the supplier shall provide shipping documentation that provides verification that the material supplied is DFARS 252.225-7008, 252.225-7009 and/or DMS 2201 (domestic only) compliant (i.e. melt source, melt country), unless otherwise specified on the purchase order. Any and all raw material shall be provided from a domestic or qualified country melt source (DFARS 252.225-7008), unless otherwise specified on the purchase order. Requests for deviation must be submitted to the Arrowhead, in accordance with Paragraph 16. Multiple heat lots are permissible, provided segregation is maintained up to and thru time of shipment.

The following lists of countries are DFAR Qualified;

Australia, Belgium, Canada, Denmark, Egypt, Federal Republic of Germany, France, Greece, Israel, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom of Great Britain and Northern Ireland.

J. NONCONFORMING PROCESS, PRODUCT, SERVICE (already delivered or rendered) (DISCLOSURE LETTER)

The Supplier must notify Arrowhead Products within 48 hours of nonconforming processes, products, or services that have already been delivered or rendered.

Company letterhead is to be used and a management representative must sign the notification. The Supplier shall submit the notification by emailing Arrowhead Products.

Notification must include as a minimum:

a) A clear description of the nonconformity

b) Affected part number(s) along with traceability number (serial number, lot number, manufacturing date, etc.)

c) Delivered quantity

d) Short term corrective action (containment plan) including replacement parts availability (schedules)

e) Potential impact on aircraft safety, if known

f) Root cause analysis

g) Corrective action implementation (serial number, lot number, data code, etc.)

h) Long-term corrective action details and schedules

Upon closure of the nonconformity, the Supplier is to provide Arrowhead Products a closing statement with status of non-conforming parts, as well as status, if required, of the long-term corrective action.

K. FOD (FOREIGN OBJECT DAMAGE / FOREIGN OBJECT DEBRIS PREVENTION)

Suppliers shall maintain a FOD prevention program appropriate to their company and their product using National Aerospace Standard NAS 412 as a guideline.

III. PRODUCT QUALITY ASSURANCE REQUIREMENTS

1. CHEMICAL & PHYSICAL TEST REPORTS

Chemical and Physical Test Reports reflecting test results shall accompany each shipment of articles defined in this purchase order. The Supplier shall provide proper traceability of raw material to any product manufactured or produced on this order. Theoretical or Range Results for Aluminum shall be acceptable, unless otherwise specified on the purchase order.

a. Test reports for each part number and serial number.

b. Test reports for each part number and each lot/batch/heat number of material.

2. CERTIFICATION OF CONFORMANCE

The Supplier shall provide a Certificate of Conformance (C of C) with each shipment of items covered by this purchase order. The Certificate of Conformance shall represent the Supplier's commitment that:

The following minimum requirements must be included on the certificate:

a) Supplier Name
b) Supplier address
c) Purchase order number
d) Purchase order revision number
e) AP part number, customer part number as applicable
f) Specification number s) in accordance with drawing requirements and any other technical definition as specified on the purchase order.
g) Specification revision (s)
h) Date of Certification
i) Quantity delivered
j) Shelf life, Expiry date, as applicable
k) Serial number, or lot/batch number and/or manufacturing date
l) Signature of authorized company personnel

a. Materials used are those which have been specified by Arrowhead, and that the items delivered were produced from material for which the Supplier has on file reports of chemical or physical analyses and any other required evidence of conformance of such items to applicable specifications.

b. Processes used in fabrication of items delivered are in compliance with applicable drawing specifications forming a part of the purchase order.

c. The products and/or services meet all applicable drawings at a specific revision and amendment level, specifications and contractual requirements.

d. FAA 8130-3 (Domestic / Export / Dual Release EASA) as applicable.

Certificates of Conformance under this requirement shall not be used in lieu of other requirements for reports specified by this purchase order.

3. AS9102 FAIR

First Article Inspection Report per AS9102 is required. The first article part (1 ea.) shall be identified ('first article'). The AS9102 First Article Inspection Report shall include all applicable B/P characteristics and notes, noting tolerance limits and actual measured values of the first article part. Averaging of inspection results or "Best Fit" functions within CMM programs are not acceptable methods of reporting inspection results; actual measured values must be provided on all first article parts.

A) AS9102 FAIR Dimensional check sheets including the heat number, part number, batch/lot number traceable to the raw material used shall specify the characteristics and shall indicate acceptance by the supplier's acceptance stamp. Whenever fixtures or tooling are used in lieu of inspection gauges, the fixture or tool numbers must be referenced on this check sheet. If measurements are captured using a CMM, Laser

Tracker, Articulating arm CMM, etc. the results report must be included with the AS9102 First Article Inspection Report. In addition to First Article Inspection Reports, the required form for Dimensional Check Sheets is the AS9102 Form 3 Latest Revision.

A full or partial FAIR is required to address any of the following changes:

1. A change in the design affecting fit, form or function of the part.

2. A change in manufacturing source(s), process(es), inspection method(s), location of manufacture, tooling or materials, that can potentially affect fit, form or function.

3. A change in numerical control program or translation to another media that can potentially affect fit, form or function.

4. A natural or man-made event, which may adversely affect the manufacturing process.

5. A lapse in production for two years or as specified by the Customer.

4. CONTROL OF SPECIAL PROCESSES

The Supplier must be approved by Arrowhead Products to perform required special processes or must use Special Process Suppliers acceptable to Arrowhead Products' customers.

When Customer approval is required to perform a special process, use the customer-designated or approved source (supplier). A list of the customer approved Special Process Suppliers will be provided upon request.

Special processes indicated below require approval or certification of the process equipment and the procedures. Certification by a responsible representative of the Special Process Supplier shall be provided for each process performed and included with each shipment.

Certificate shall indicate all special processes performed and applicable specification including class, type, grade, etc., as applicable.

a) Chemical treatment, plating and coating

b) Brazing, soldering, welding

c) Thermal treatment

d) Non-destructive - chemical, metallurgical and engineering test services

e) Special cleaning

5. ARROWHEAD SOURCE INSPECTION

Items to be delivered under this purchase order require inspection, tests or surveillance by the Arrowhead Quality Representative at the Supplier's plant. The Supplier shall notify Arrowhead Products' Buyer when the final inspection process is completed and the hardware is acceptable. Source inspection by the Arrowhead Products Quality Representative will consist of reviewing the shippable documentation and performing and/or witnessing random dimensional inspection(s) on drawing characteristics. Arrowhead Products' Quality Representative may participate in the manufacturing/inspection process at any time from inception until the hardware is complete. The level of involvement at the Supplier's plant will be dependent on the complexity/criticality of the hardware and the Supplier's performance to the Arrowhead Products requirements.

Source inspection does not relieve the Supplier of the responsibility for compliance with all requirements of this purchase order. Evidence of source inspection must accompany or be shown on the shipping documents. Arrowhead Products reserves the right of final acceptance at the Arrowhead Products facility. Items submitted under this clause shall have passed Supplier's inspection.

a) In-process and final inspection or tests or both are required. Parts, assemblies, processes and tests are subject to detailed inspection by an Arrowhead Quality Representative prior to assembly, test and/or delivery.

b) Final inspection and/or test(s) by an Arrowhead Quality Representative are required prior to delivery.

c) In-process inspection and/or test(s) by an Arrowhead Quality Representative are required prior to delivery.

6. GOVERNMENT SOURCE INSPECTION

During performance on this order, your Quality Control or inspection system and manufacturing processes are subject to review by authorized Government Representatives.

a) Government inspection is required prior to shipment from your plant. Upon receipt of this order promptly notify the Government Representative who services our facility.

b) Government inspection or release of product prior to shipment is not required unless you are otherwise notified. Supplier shall provide a copy of this order to his Government Representative upon his request.

7. QUALITY CONTROL SYSTEMS

The Supplier's Quality Management System shall comply with the requirements of:

~~a) Mil-Q-9858 (issue in effect on date of order)~~ (obsolete)

b) & c) ISO 9001

~~d)ISO 9002 (obsolete)~~

e)AS9100

8. RECORD RETENTION, MAINTENANCE AND DISPOSITION

By acceptance of the Purchase Order, the Supplier certifies that objective evidence of conformance to the drawings, specification, as required by the Purchase Order, will be on file and available for examination by Arrowhead for:

a) 7 years

b) 10 years

c) Life of Program (Indefinite)

d) Rolls Royce P.O.'s, QCI-16-055, Quality Records, Section 6.5 applies

e) Per Customer specific requirements

f) 15 years

g) Indefinitely

The supplier shall ensure records of the supplier's subcontractor(s) shall remain on file by the supplier's subcontractor(s) or the supplier for the same specified retention period.

The supplier shall make such records available to Arrowhead Products and its authorized representatives, its customers, and regulatory authorities.

When requested by Arrowhead Systems, the supplier shall make specified records available in the English language.

At any time during the identified retention period, at Arrowhead Products' request, the supplier will deliver such records or any part thereof in format / media and within a time frame as agreed to by both parties, to Arrowhead Products, at no additional cost.

At expiration of the retention period, if there is intent to dispose of such records, then prior to disposal, the supplier shall notify Arrowhead Products in writing. Arrowhead Products reserves the right to request delivery of such records. In the event Arrowhead Products chooses to exercise this right, the supplier shall promptly deliver such records to Arrowhead Products at no additional cost on media agreed to by both parties.

At expiration of the retention period, Arrowhead Products shall direct the supplier of the disposition method, depending on the records' criticality and confidentiality.

9. IDENTIFICATION (Item / Piece)

Each item/piece covered by this order shall be identified completely as specified:

a. Electro-chemical etch
b. Perma-ink stamp or electro-etch optional
c. Steel impression stamp
d. Tag Identify
e. Bag identify
f. Drawing/Specification nomenclature
g. Arrowhead and Manufacturer’s part number and revision (include DCN &/or EO if applicable)
h. Serial Number
j. Heat/Batch Number
k. Purchase order Number
l. Cure date/Manufacture date
m. Quantity
n. Laser Mark
p. Engrave

10. IDENTIFICATION (Lot / Batch)

Each lot/batch container covered by this order shall be identified completely as specified:

a. Electro-chemical etch
b. Perma-ink stamp or electro-etch optional
c. Tag identity
d. Bag identity
e. Wax crayon identity
f. Drawing/Specification nomenclature
g. Arrowhead and Manufacturer’s part number and revision (include DCN &/or EO if applicable)
h. Heat/Batch Number
j. Purchase Order Number
k. Cure/Manufacture Date
l. Quantity
m. Laser Mark
n. Engrave

11. IDENTIFICATION (Commercial)

Commercial (catalog and proprietary items) identification will be acceptable in the fulfillment of this order.

12. IDENTIFICATION (Sheet Stock)

All sheet stock shall be line marked with the material type of alloy, material specification numbers, heat number, the condition (if applicable), manufacturer’s identification and nominal thickness.

13. IDENTIFICATION (Coiled / Rolled Material)

Coiled stock and rolled material shall be identified by a method integral to the core and which will be visible until the material has been completely removed from the core. The identification shall include as a minimum, material

type or alloy, condition (if applicable), nominal thickness, heat/batch number, purchase order number and material specification number.

14. INSPECTION DATA, TEST PLAN, AND INSPECTION VERIFICATION TECHNIQUE SHEET

The Supplier shall prepare Inspection Data, Test Plan or Verification technique sheet for the items delivered under this Purchase Order. Copies of the completed form must be submitted to AP with each shipment. If statistical inspection is used, the passing sampling plan rejection must be zero defects. Sampling plans must be in accordance to ANSI/ASQ Z1.4 and based on a statistical and reliable confidence level capable of detecting nonconforming product. This sample plan shall be used unless otherwise instructed by the purchase order, or SOW.

a. **The Inspection Data** form shall include identification of the item to be inspected, measuring equipment to be used, method of inspection (visual, test equipment, gauge, etc.), type of characteristic being measure (key, critical, major, minor), and type of inspection (dimensional, functional, NDT, etc.). Form 3 of AS9102 (First Article Inspection) can be used to satisfy this requirement.

b. **The Test Plan** shall contain the operational sequence and test points in relation to procurement, manufacture, assembly, checkout, and delivery. The Test Plan shall be submitted to Arrowhead Products for approval at least 30 days prior to production.

c. **The Inspection Verification Techniques** Sheet shall be filled out by the supplier and submit it to AP for approval 10 working days before the delivery of the product. The form 1196 can be found at Arrowhead Products' website under Support / Supply Chain Management.

15. FIRST ARTICLE APPROVAL

An AS9102 First Article, representative of production methods, processes or services performed under this Purchase Order, shall be submitted to Arrowhead Products, for Quality Assurance approval prior to shipment of production articles. Arrowhead Products approval of the AS9102 First Article does not relieve the Supplier of any responsibility for conformance to the requirements of the purchase order, drawings, or specifications, on the first or subsequent shipments.

16. NONCONFORMING PROCESS, PRODUCT, SERVICE - (AUTHORIZED DEVIATIONS)

The Supplier must notify Arrowhead Products within 48 hours of nonconforming processes, products, or services and obtain approval for their disposition.

A Supplier Deviation Approval request (SDAR) Arrowhead Products Form No. 922, is to be initiated by the Supplier for any departure from drawings, specifications or other Purchase Order requirements and must adequately describe such departures, including a complete description of the cause and corrective action taken to preclude recurrence. The SDAR shall be submitted to the Arrowhead Products, which will arrange for Arrowhead Products Material Review Action. A copy of the completed SDAR will be returned to the Supplier, showing results of the Material Review decision. Supplier shall not ship a discrepant item reported and submitted on a SDAR prior to Material Review decision without Arrowhead’s prior concurrence.

The Supplier shall refer to the serial number of SDAR on each shipping document which covers items in the SDAR. Items shipped on a SDAR must be segregated from other items to permit separate identification to be maintained.

When Arrowhead Products does not have Material Review authority, the end item customer shall be notified and authorization to ship requested.

NOTE: When Supplier submits a SDAR on discrepant items prior to shipment, the non-conforming condition will not be charged to the Supplier’s Quality Performance Record.

17. WORKMANSHIP

Items or processes performed under this Purchase Order shall exhibit workmanship indicative of aerospace quality. Evidence of flaws, mishandling or abuse shall be cause for rejection. Items must be furnished clean and free of foreign material such as chips, dirt, oils, etc.

18. PRESERVATION & PACKAGING

The following requirements apply only when specific preservation and packaging instructions are not invoked by the purchase order:

a. All supplies intended for delivery on the Purchase Order shall be protected against the usual hazards of corrosion, contamination, deterioration or other spoilage at the Supplier's facility and prior to delivery.

b. All supplies delivered under this Purchase Order shall be packaged with suitable protection to prevent corrosion, contamination, deterioration, spoilage or handling damage during transit and while in storage at Arrowhead Products.

19. SUPPLIER ASSISTANCE

The Supplier shall request assistance through Arrowhead Products to clarify: (a) Engineering Drawing or Specifications or (b) Purchase Order Requirements.

20. AGE CONTROL

The Supplier shall have an effective system of age control of items whose acceptability is limited by age of the item. The system must include a method of identifying the age of such items and provisions for the rotation of stock.

a) Supplier shall show on each container of materials having a limited or specified shelf life (both Supplier's in-plant containers and containers in which material is delivered to Arrowhead) the cure or manufacture date, expiration date of or batch number and special storage and handling conditions applicable to the contents. This information shall be in addition to the normal identification requirements of name, part or code number, specification number, type, size, quantity, etc. Special handling conditions shall be recorded on certifications and shipping documents covering the material as delivered to Arrowhead, in addition to normal identification information.

b) Time lapse between cure or manufacturing date and date of scheduled receipt by Arrowhead Products under this Purchase Order shall not exceed one third of the shelf life for the material without a prior written and approved waiver from Arrowhead Products for each shipment.

c) In no case shall material be supplied with less than 80% of the useful life cycle remaining.

21. CONTROL OF NONDESTRUCTIVE TESTING

Items requiring NDT shall be submitted, complete with part drawing or document establishing NDT requirement, to a laboratory acceptable to Arrowhead. Test results shall be reported in writing to Arrowhead Products, identifying the laboratory and the certified technician who performed and/or evaluated the tests, signed by a responsible laboratory representative. An adequate method of identifying and cross referencing each x-ray film exposure report and item must be provided. When parts are serialized, serial numbers must appear on the report and film with the control number.

a. Minimum radiographic requirements are included in this purchase order, on attached sketch.

b. Radiographic film of each lot and other NDT results shall be inspected by Arrowhead Products at the laboratory performing the work prior to shipment. The Supplier shall notify the Arrowhead Products buyer when the film is ready for review.

c. NDT reports shall be submitted with each shipment to the Arrowhead and shall include x-ray film when radiographic inspection is required.

22. LOT CONTROL & MATERIAL TRACEABILITY

a. Items furnished under this purchase order, packing list, certifications and other applicable documents must be identified by manufacturing lot or batch number. Where impractical to stamp individual parts due to size or shape, the lot or batch number shall be stamped on identifying tags or the smallest unit package.

b. Materials used must be identified by lot number, material type, specification and applicable change number, heat number, etc., and traceable to the lot number(s) of materials used. Traceability records shall be available for review by an Arrowhead Products representative.

23. TOOLING DESIGN/FABRICATION

This purchase order is for the design and/or fabrication of tooling that will be utilized for the manufacturing of production hardware and/or inspection media. The following deliverable items are required with each shipment:

a) Tooling design suppliers must adhere to the following process in order to close out a purchase order line item specifically for the tool design function OR to proceed to fabrication of the tooling:

1) Tool design must be developed from an Arrowhead designed part sketch/model/drawing. This sketch/model/drawing shall be provided to the Supplier via a secure FTP site and/or standard mail.

2) A tool design review with the cognizant Manufacturing Engineer and/or Tooling Engineer is required prior to completion of a purchase order line item OR to proceed with tooling fabrication. If the Manufacturing Engineer and/or Tooling Engineer do not approve the design the Supplier must repeat the process of tool design review until an acceptable design is approved by the Manufacturing Engineer and/or Tooling Engineer.

3) To signify the completion/approval of the tool design review a signature block must be contained within the title block of the drawing. The required signatures will be the tool designer and cognizant Arrowhead Products Manufacturing Engineer and/or Tooling Engineer.

4) All Tool Designs are property of Arrowhead Products after the completion of the approval cycle.

b) An AS9102 First Article from an Arrowhead Products approved Inspection Lab OR an Arrowhead Products approved Tooling Fabrication- Inspection Supplier.

c) The electronic report (If Applicable) from the method of inspection utilized to validate dimensional acceptance. This would include but is not limited to the following methods: CMM, Laser Tracker, or Articulating arm CMM.

24. STATISTICAL PROCESS CONTROL

This Purchase Order contains key characteristics as defined by Boeing Specification DI-9000 and Arrowhead Products QCI-22-085. Process control variable data shall be supplied with part shipment.

25. CERTIFICATION OF CALIBRATION

A. General Calibration

Measuring and test equipment supplied or serviced under this Purchase Order shall be calibrated in accordance with Military Specification MIL-STD-45662 'Calibration System Requirements', or in accordance with ANSI/NCSL Z540 (Current Rev.), ISO10012 (Current Rev.), 'Calibration Laboratories and Measuring Equipment-General Requirements', and/or the AMS2750 Pyrometry specification. Additional flow down requirements shall be in accordance with AP specifications QCI-11-042 Precision Gage Control and Calibrations & QCI-09-081 Thermal Treatment of Corrosion Resistant Steel & Titanium Alloys, when applicable.

A preliminary written report is required after each calibration and shall be provided to Arrowhead Products Calibration Technician in the interim a formal report provided to Arrowhead Products. A certification of calibration to the applicable specification is required with each shipment/on-site calibration service provided.

When "Out-of-Tolerance" conditions are detected the Supplier shall notify Arrowhead Products immediately and stop work until direction is provided by Arrowhead Products. The Calibration Technician will then follow Arrowhead Products' procedure per QCI-11-042.

Calibration suppliers shall furnish all procedures/specifications utilized to perform TUS/SAT's or any additional test(s) for review and approval prior to test(s) and/or calibration.

B. Witness of Testing/Calibration

1. Witnessing of the calibration/testing service is required. Once there have been four (4) consecutive calibrations and upon successful results the witness schedule will be revised to be performed on an annual basis.

C. Forms Requiring Completion at time of Calibration Service:

1. Form numbers ARPRO 1064 (Heat Treat Instrumentation Calibration Checklist) and 1065 (Heat Treat Temperature Uniformity Survey Checklist) are required to be completed at the time of Calibration of the Heat Treat equipment.

D. The Certificate of Conformance for the Calibration Service shall include the requirements of Para. 2 and the following elements:

a) Statement on certification signifying traceability to N. I. S. T.
b) Identification/description of the item
c) The correct specifications are specified on the certification
d) The current revision of the specification are called out on the certification
e) Environmental conditions recorded during calibration
f) Standards used and that calibrations of standards are current
g) Date calibration was performed and next due date
h) Calibration results (as received condition and after calibration is complete).
i) Correction factors used (if applicable) shall be noted on the certifications.
j) Certification of thermocouple wire used if applicable.
k) Signature (or stamp) of individual certifying the work performed
l) Statement of uncertainty and/or accuracy level, when applicable.

26. ROLLS ROYCE

For Rolls Royce Orders the following apply:

A. SABRe requirements:

1. Business Requirements
2. Supplier Approvals
3. Control of Sub-tier Suppliers
4. Source Change
5. Release notes (Certification of Conformity)
   Where delivery has been produced in accordance with an “Approval Plan, Quality Plan or equivalent document” as specified on the purchase order, release note(s) shall carry a clear reference to its unique number and issue status. Example: “Approval Plan - XXXXX (issue 1)”
6. First Article Inspection and Component Proving
7. Control of documents

B. Rationalized Process Specification (RPS)

If an RPS Specifications Applies for Materials one or more of the following may apply per Drawing Requirements:

1. RPS 905, Procurement and Control of Raw material for Manufacture of Components.
2. RPS905/1, Procurement and Control of Wrought Material for the Manufacture of Components.
3. RPS905/2, Procurement and Control of Forgings and Flash Butt Welded Ring for the Manufacture of Components
4. RPS905/3, Procurement and Control of Castings for the Manufacture of Components to Rolls-Royce Requirements
5. RPS905/8, Procurement and Control of Non-Metallic Material for the Manufacture of components.

C. Suppliers shall ensure segregation between aerospace and commercial materials.

D. All SABRe documents can be located on Rolls Royce website for the latest revisions.

If you are unable to locate the aforementioned Rolls Royce documents, please contact the purchasing buyer.

27. LOCKHEED MARTIN AERONAUTICAL

Lockheed Martin Aeronautical Orders the following apply:

A. Processing 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(s) on this purchase order and the revision in effect as of the date of this PO of Lockheed Martin Aeronautics Appendix QJ. All requirements of such Appendix QJ paragraph 12.a.-f. shall be accomplished. Appendix QJ is located at Lockheed Martin's website.

Specification(s) Title, Specific Revision Level(s) and drawing(s) requirement(s) to be performed by a QCS-001 Source. The Supplier's unique LM Aero identification number (vendor code) as well as the "Process Code" must also be present on the purchase order.

B. All Suppliers shall maintain a FOD prevention program in accordance with National Aerospace Standard NAS-412, and meet the requirements and specified elements of Quality Clause Q4R. The Q4R clause can be found at Lockheed Martin's website/supplier portals.

C. All Suppliers shall meet the requirements of Appendix QX Paragraph 1.4 (Counterfeit Parts Prevention) paragraph letters A through D. Appendix QX can be found at Lockheed Martin's website/supplier portals.

D. All Suppliers shall implement and maintain a Software Quality Program or methodology that meets all of the requirements of Lockheed Martin Quality Clause Q6R. The Q6R clause can be found at Lockheed Martin's website/supplier portals.

E. First Article Planning/Completion shall be completed in accordance with the Q2A Clause. The Q2A clause can be found at Lockheed Martin's website/supplier portals.

If you are unable to locate the aforementioned Lockheed Martin's document(s), please contact the purchasing buyer.

28. PRATT & WHITNEY ROCKETDYNE

PRATT & WHITNEY ROCKETDYNE Orders the following apply:

A. Aerospace Supplier Quality Requirements (ASQR-01)

The ASQR-01 document applies to suppliers and all members of their supply-chain who furnish product, material, processes, and service.

If you are unable to locate the aforementioned Pratt & Whitney Rocketdyne document(s), please contact the purchasing buyer.

B. Approved Process Source- Deliverable Documentation

Supplier or Supplier's subcontract process sources shall be an approved processor or shall use approved processors as required by purchase contract. A list of approved processors and associated processes are available from the Supplier Portal tool.

If the list of approved processors is unavailable to your facility please contact the purchasing buyer and a list of Pratt & Whitney approved sources for the process in question will be made available.

A Certificate of Conformance or equivalent Process certificate, signed by an authorized agent of the Processor / Supplier shall be included with shipping documentation (packing slip). The certificate shall include purchase contract number, part number(s), trace number (as applicable), process specification number with revision, processing date(s) and name of the Processor(s) performing each of the approved processes.

C. Hazardous Materials Requirements

By providing the Certificate of Compliance, it is certifying there is documented evidence showing compliance with Buyer Specification RF0004-425 entitled, "Hazardous Materials Use and Control". A copy of this specification is available through the purchasing buyer.

D. Metallic - Materials Acceptance Testing – Canoga Park

Specification RC5166 requires parts and materials procured for the J2X programs to have all verification testing performed by laboratories approved to RC5166. Test reports shall contain acceptance test results for each lot of material.

E. Personnel Requirements

Annual eye examinations are required for all welders, inspectors, and calibration personnel performing operations directly and indirectly related to the manufacture and inspection of Pratt & Whitney Rocketdyne product.

29. ARROWHEAD PRODUCTS CHINA (APC)

APC hardware shall be inspected 100% prior to leaving the APC facility.

A. Material Certifications

If clause 1B is called out in the Purchase Order Clauses material certifications need to be provided with the shipment. All material must be purchased from an Arrowhead Products Los Alamitos, CA approved source.

B. AS9102 FAIR

The AS9102 FAIR quality clause number 3 will be present on every Purchase Order to Arrowhead Products China (APC). The intent of this callout is to ensure that if any of the following occur that a complete or partial (Delta) first article is performed.

A full or partial FAIR is required to address any of the following changes:

1. A change in the design affecting fit, form or function of the part.
2. A change in manufacturing source(s), process(es), inspection method(s), location of manufacture, tooling or materials, that can potentially affect fit, form or function.
3. A change in numerical control program or translation to another media that can potentially affect fit, form or function.
4. A natural or man-made event, which may adversely affect the manufacturing process.
5. A lapse in production for two years or as specified by the Customer.

If instances 1 thru 5 **do not** pertain to the current shipment a copy of the completed First Article shall remain on-site at APC.

C. Identification / Packaging

Identification of all parts shall be performed as required per the purchase order instructions. Additionally, only one (1) part number per box is acceptable and the applicable identification information is required to be on the outside of that same shipping box.

All packaging material must be new material. Previously used bubble wrap or paper packaging is not an acceptable packaging practice.

D. Documentation

Documentation must be provided via the File Transfer Protocol (FTP) provided by Arrowhead Products (Los Alamitos, CA).

The Certificate of Conformance (C of C) must be provided in the box with each shipment.

The pick list of materials used for the build of the hardware must be included with each shipment.

E. Cessna Ducting

Cessna flame test approval is required prior to material usage.

Additionally, the shipment for each Cessna end-item duct must include the applicable flammability certification with the documentation package.

F. Surface Acceptance Criteria

QS-004 Surface Acceptance Criteria for Resin Composite Parts is applicable to this order.

G. 100% Dimensional Check

Provide 100% dimensional sheet check report for each individual part and document on the AS9102 Form 3, until the complete FAIR is performed.

30. <u>FLEXIDER QUALITY CLAUSES (Liebherr TBM 850 Program)</u>

All requirements are in accordance to LTS-INS-AQ-0276

A. AS9102 FAIR

All AS9102 First Articles require Arrowhead Products Approval prior to drop shipment to Liebherr. The AS9102 First Article should be completed to both the Arrowhead Products part number as well as the Liebherr part number. Please submit the completed AS9102 First Article to the Arrowhead Products buyer who will then submit the documentation to the appropriate personnel for review and approval.

B. Manufacturing Planning/Routing

All routers (and any changes once master routers are approved) must be approved by AP Manufacturing Engineering and Quality Engineering. Please submit the master routing change to the Arrowhead Products buyer who will then submit the documentation to the appropriate personnel for review and approval.

C. QSE (Quality, Security, Environment) System

All special processes must be compliant with the requirements of Nadcap.

D. Inspection & Testing Means

In all cases, tested units will have to be delivered inspection stamp on or near to the nameplate.
Equipment shall be delivered in perfect condition. In any case, no equipment with visual defect will be accepted by LTS, unless it was previously accepted by LTS MRB upon Partner's request.

E. Certificate of Conformance

The Certificate of Conformance shall include the following information:

a. Name & Address
b. Purchase Order number including the amendment (If existing)
c. Quantity delivered by traceability number
d. LTS part number
e. LTS' customer part number and/or all other identification required by the LTS' customer
f. Serial number, or lot/batch number and/or manufacturing date
g. Assembly or manufacturing date when serial numbering is not applicable
h. Shelf life, Expiry date, as applicable
i. Inspection stamp or name, function, signature, date
j. And all other LTS final customer requirements

F. Handling, Storage, Packaging, Preservation and Delivery

All equipment shall be delivered in individual packaging accompanied by its dossier.

G. Delivery Documentation

The original documents will be placed inside the packaging. The documents include the following:

- Certificate of Conformance
- Delivery Note
- Packaging Information
- ATR and/or inspection/tests records unless otherwise stated in writing by AQFP (if the ATR covers several S/N, put a copy with each part).

31. BOEING SLS QUALITY CLAUSES

General

Supplier procedures prepared in accordance with drawing/specification requirements for this program shall require the written approval by AP and their customer prior to use.

Specific

A. Government Source Inspection

The Government Source Inspection points will be provided to the Supplier prior to manufacturing via the purchase order. When Government Source Inspection is imposed per this quality clause the supplier must notify the Arrowhead Products' buyer 48 hours in advance of the need for the Government Source Inspection point. Evidence of the Government Source Inspection completion will be required with the shipment paperwork to Arrowhead Products; this can be present on the Shipper, C of C, or another suitable document but must be shipped with the delivered hardware.

B. Boeing Source Inspection

The Boeing Source Inspection points will be provided to the Supplier prior to manufacturing via the purchase order. When Boeing Source Inspection is imposed per this quality clause the supplier must notify the Arrowhead Products' buyer 48 hours in advance of the need for the Boeing Source Inspection point. Evidence of the Boeing Source Inspection completion will be required with the shipment paperwork to Arrowhead Products; this can be present on the Shipper, C of C, or another suitable document but must be shipped with the delivered hardware.

i. Final Source Inspection and/or test(s) by a Boeing Quality Representative are required prior to delivery.

ii. In-Process BMIP and/or test(s) by a Boeing Quality Representative are required prior to delivery.

C. Approved Process Source

When a Special process is required to be performed per drawing requirements that is either an Industry Standard or Arrowhead Products' customer specification then the following requirement shall apply:

Parts must be processed by a Boeing Approved Process Source or NADCAP Approved for the Special Process being performed.

Once the process has been performed by an Approved Processor the signed certificate of conformance / equivalent process certification must include the following:

a. Name and address of Processor(s) performing each of the processes
b. Purchase order number
c. Part Number(s) and revision
d. Process specification number (s) in accordance with drawing requirements
e. Process specification revision
f. Processing date(s)
g. Quantity processed
h. Serial number(s), heat number, or lot/batch number
i. Signature of authorized company personnel

D. Serialization, Built-To-Specification

Serialization is required for the SLS program and the following parameters apply:

a. Sequential Serial Numbers must be assigned and shall not exceed 16 characters

b. Parts for repair, rework, or rework to a new configuration with the same base number shall retain the original serial number.

c. Serial number shall be indicated on all shipping reports.

d. Listing serial numbers is acceptable provided that any breaks in the range are so noted (e.g. S/N: 001-0010, 0012-0020, 0025-0030 for a total of 25 parts).

e. If parts are delivered in multiple shipments, only the serial numbers applicable to that shipment shall be noted in the shipping report.

E. Eddy Current Inspection

Each manufactured part shall be Eddy Current tested on all threaded and unthreaded holes and high stress areas indicated on the Arrowhead Products drawing per Arrowhead Products QS-340. Acceptance criteria shall be per Arrowhead Products QS-342. Supplier shall notify Arrowhead Products the source to be used to perform Eddy Current. Source must be approved by Arrowhead Products. Supplier shall notify Arrowhead Products if supplier cannot perform nor has a source to perform Eddy Current testing.

Arrowhead Products will make arrangements for Eddy Current testing if supplier is not capable nor has a source for Eddy Current Testing.

F. NDT Technique Sheets, Process Procedures and Personnel

Technique Sheets and/or Process Procedures for Ultrasonic Inspection, Penetrant Inspection, X/ray, and/or Eddy Current Inspection created by the Supplier for processing parts for SLS hardware must be approved by Arrowhead Products and Boeing prior to processing. Contact AP Procurement for the appropriate technique sheet format.

All personnel performing NDT shall be at a minimum Level II and meet the requirements for training, qualification, examination, and certification specified in NAS 410

G. NDT Acceptance Criteria

Any suspected indications that do not meet the acceptance criteria of the applicable specification requirements, detected during Ultrasonic Inspection, Penetrant Inspection and/or Eddy Current Inspection of raw material are grounds for immediate removal of that material from the production base and shall not be used.

H. Packaging & Preservation

The following requirements apply only when specific preservation and packaging instruction are not invoked by the purchase order. All supplies delivered under this purchase order shall be packaged in the same method in which it was received. The supplies shall be packaged with suitable protection to prevent corrosion, contamination, deterioration, spoilage or handling damage during transit and while in storage at Arrowhead Products. Use of Acid Free Kraft Paper, MIL-DTL-17667E Type 1, is the only Kraft Paper permissible for use on space products; all other Kraft Paper products are not suitable for use on space products as they may cause surface contamination.

J. Frozen Planning

The initial Router/Planning must be reviewed and approved by Arrowhead Products Quality and Engineering representatives before work can commence on production parts. All subsequent revisions to the Router/Planning must be reviewed and approved by Arrowhead Products Quality and Engineering representatives prior to application on production parts. History of revision shall be maintained.

K. Material Verification "Fingerprinting"

Material Verification shall be performed by a third party to validate chemical analysis of the material prior to use on production parts. Composition Fingerprinting shall be obtained using Gas Chromatography/ Mass Spectroscopy per Boeing STM0878 on each batch/lot number.

L. For Use in Human Space Flight

For use in human space flight; materials, manufacturing, and workmanship of highest quality standards are essential to astronaut safety. If you are able to supply the desired item with a higher quality than that of the items specified or proposed, you are requested to bring this fact to the immediate attention of the purchaser.

32. BOEING BDS QUALITY CLAUSES

A. 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.

Supplier 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.

B. Specification Supersession:

For government specifications and standards canceled after June 1994, Supplier 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.

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.

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.

33. FEDERAL AVIATION ADMINISTRATION (FAA) REPAIR STATION CLAUSE

In acceptance of the purchase order, the vendor is required to maintain an FAA approved Drug and Alcohol Testing Program and must allow the FAA access to inspect all work performed on behalf of Arrowhead Products. (Ref. FAR Part 145.217)

34. SAMPLING INSPECTION

Sampling inspection shall be performed in accordance with the C=0 Table below, AQL Level 1.0.
Form number ARPRO 1135 must be filled out to provide objective evidence that sampling inspection was performed. A range of actuals for each dimensional feature and an indication of "Acceptable" for notes on the drawing are required to be documented on this form 1135 which is available on our website: www.arrowheadproducts.net Support, Supply Chain Management, Supplier Application. The Supplier shall submit a completed copy of form 1135 with each shipment of items covered by this purchase order

	AQL Level				
Lot size	**0.25**	**0.4**	**0.65**	**1.0**	**1.5**
5-10	*	*	*	8	5
11-15	*	*	11	8	6
16-20	*	16	12	9	6
21-25	22	17	13	10	6
26-30	25	20	16	11	7
31-35	28	23	18	12	8
36-50	*	32	20	13	8
51-90	50	32	20	13	13
91-150	50	32	20	19	19
151-280	50	32	29	29	19
281-500	50	48	47	29	21
*** 100% INSPECTION REQUIRED**					

35. 100% INSPECTION

Items to be delivered under this Purchase Order require 100% Inspection of all dimensional characteristics/ features throughout the lot quantity. Form Number ARPRO 1135 must be completed on all ULA POs and Form Number ARPRO 1162 must be completed on all Boeing SLS POs by Source Inspection to provide objective evidence that all identified critical characteristics were inspected. A range of actuals for each dimensional feature and an indication of "Acceptable" for notes on the drawing are required to be documented on these form (1135, 1162) which are available on our website: www.arrowheadproducts.net Support, Supply Chain Management, Supplier Application.

REVISION HISTORY

Previous Revision History – ON FILE

Revision 49:

Revision 49 added the following sentence to Boeing Q-Clause 38 specifying the only type of Kraft Paper that is acceptable for use on space products. *Use of Acid Free Kraft Paper, MIL-DTL-17667E Type 1, is the only acceptable Kraft Paper permissible for use on space products; all other Kraft Paper products are not suitable for use on space products as they can cause surface contamination.*

Revision 50:

Revised Quality Clause 29 – General Clause and 29B & 29D.
Revised Clause 14 to include 14C
Revised 31B to add sub paragraph i & ii
Added clause 31L

Revision 51:

Revised Quality Clause 29A to read as follows: If clause 1B is called out in the Purchase Order Clauses material certifications need to be provided with the shipment. All material must be purchased from an Arrowhead Products Los Alamitos, CA approved source.
Revised Quality Clause 29D to include the following statement: The pick list of materials used for the build of the hardware must be included with each shipment.

Revision 52:

General Requirements II:
Revised Quality Clause A3 to include the statement of "prevent the use of counterfeit parts". Replace "counterfeit goods" with "counterfeit parts".
Rephrased A7 and A9. Added A9.
Rephrased F. Rephrased J to add 48 hours for notification.

General Requirements III:
Obsoleted 7(a), 7(b) and 7(d).
Added 8(g).
Added section 8 for Record Maintenance and Disposition.
Rephrased 16 to add 48 hours for notification.
Added 80% shelf life requirement to 20 (c).
Added section 10, employee Awareness.

Revision 53:

The changes captures typo errors, format, wrong reference, and deletion of repeated words in many paragraphs of the document.

Replaced 7b with ISO 9001

Revision 54:

Added to 9g & 10g “(include DCN &/or EO if applicable)”

Revision 55:

Page 2: Section II. B added “The performance of the supplier shall be monitored by Arrowhead Products”. Page 7: Section III.8 was “…Arrowhead Products reserves the right to advise the supplier of the disposition method, depending on the records' criticality and confidentiality” changed to “…Arrowhead Products shall direct the supplier of the disposition method, depending on the records' criticality and confidentiality.