

AERO-K, INC.

SUPPLIER FLOW-DOWN REQUIREMENTS (FDR)

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1. PURPOSE

This document establishes general and special product assurance requirements clauses for use on the Purchase Order and is part of the Terms and Conditions when referenced on the Purchase Order. It is intended to clearly define all requirements for the Seller to assure that all products delivered by Seller on the Purchase Order conform to Buyer specified requirements for quality, reliability and integrity.

2. APPLICABILITY

- 2.1 GENERAL REQUIREMENTS - Unless expressly excluded on the Purchase Order, the general product assurance requirements defined in Clause Q010 (Section 3) apply to all orders, and Seller's compliance to these requirements is subject to verification by Buyer.
- 2.2 SPECIAL REQUIREMENTS - The special product assurance requirements defined by the various numbered "Q" clauses (Section 4) apply only when the specific clause number is called out on the Purchase Order.
- 2.3 FLOWDOWN REQUIREMENTS - To assure conformance to all Purchase Order requirements, Seller shall flow down applicable requirements to Seller's subtier sources, when such sources are used by Seller for procurement of products and/or services scheduled for delivery to Buyer.
- 2.4 REFERENCE DOCUMENTS
- 2.4.1 APPLICABILITY - All documents, including drawings and specifications, whether AERO-K, Industry or Government, are considered part of the Purchase Order requirements when specified directly on the Purchase Order or in documents referenced by the Purchase Order.
- 2.4.2 DOCUMENT REVISION STATUS - Unless otherwise specified on the Purchase Order or referenced documents, the revision status of all applicable documents in effect on the date of issue of the Purchase Order, apply to the order.
- 2.4.3 DOCUMENT SOURCES - Copies of AERO-K proprietary documents, and any special documents not generally available from commercial sources, required by Seller to comply with Purchase Order requirements, will be furnished to Seller by Buyer. Copies of Industry or Government documents and standards are available from a number of commercial sources, and Seller is responsible for obtaining such documents. Any problems experienced by Seller in obtaining required documents should be brought to the attention of Buyer.

3. GENERAL REQUIREMENTS CLAUSE

Q010

GENERAL REQUIREMENTS - Seller shall be responsible for meeting all requirements of paragraphs 3.1 through 3.10.

- 3.1 PROHIBITED PRACTICES - The following acts and practices are prohibited, and any violation not approved by Buyer in writing may result in disqualification of Seller.
- (a) UNAUTHORIZED FACILITY CHANGES - During performance on the Purchase Order, Seller shall give Buyer written notice before relocating any production, inspection or processing facilities, or transferring the work between different facilities, or making any other changes that may affect product quality.
 - (b) UNAUTHORIZED PRODUCT CHANGES OR SUBSTITUTIONS - Seller shall not make any changes or substitutions to any product(s) or service required by the applicable drawing, specification or document without prior written authorization by Buyer. Authorization may be contingent on Buyer or Buyer's representative's review of proposed changes at the facilities of Seller or Seller's subtier sources.
 - (c) UNAUTHORIZED REPAIRS - Seller shall not perform any repairs by welding, brazing, soldering, plugging, bushing, or use of paints, peening, adhesives or plating, or any other repair method, on products damaged or found to be discrepant during fabrication or processing, or on defects in castings or forgings, unless such repairs are specifically authorized by Buyer in writing.
 - (d) USE OF NEWSPAPER FOR PACKAGING - Due to the acid nature of ink, the use of newspapers for packaging product(s) is prohibited.
 - (e) UNAUTHORIZED USE OF NONCONVENTIONAL MANUFACTURING METHODS - Unless specified on the drawing, specification or Purchase Order, Seller shall not use any non-conventional manufacturing or processing methods, such as electrical discharge machining (EDM), electro-chemical machining (ECM), laser or abrasive water-jet cutting or drilling, flame spray coatings, etc., on product(s) scheduled for delivery to Buyer without prior written authorization by Buyer. Authorization may be contingent on Buyer or Buyer's representative's review and approval of the method, facilities, equipment and qualified personnel.
- 3.2 RESPONSIBILITY FOR PRODUCT CONFORMANCE - Neither audit, surveillance, inspection and/or tests made by the Buyer or Buyer's representative at either the Seller's or Buyer's facility, nor Seller's compliance with all applicable Product Assurance Requirements Clauses herein, shall relieve Seller of the responsibility to furnish product(s) that conform to all of the requirements of the Purchase Order.

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- 3.3 SELLER DESIGNED PRODUCTS - When the Purchase Order is for AERO-K approved product(s) under Seller's engineering design control, Seller shall notify Buyer in writing of any changes in the approved product description. AERO-K reserves the right of disapproval of all changes.
- 3.3.1 CLASS I CHANGES - Any change in design, fabrication, methods, or processes that will result in a Class I change (as defined in MIL-STD-973) shall be submitted to Buyer for Buyer's written approval prior to effecting such change.
- 3.3.2 CLASS II CHANGES - Seller may incorporate Class II changes without prior approval. Seller shall furnish a copy of the revised product description or waiver prior to delivery of the revised product.
- 3.4 BUYER INITIATED CHANGES
- 3.4.1 EFFECTIVITY - Seller shall incorporate on product(s), at the specified effectivity points, all changes to drawings, specifications, tests, inspection and fabrication methods, or any other changes initiated by Buyer through a formal Purchase Order change and/or amendment. Seller's system shall include appropriate controls and records, including records at Seller's subtier sources, showing the date, lot, serial number, revision letter, or other positive identification that provides objective evidence of incorporation of all changes in product(s). Such records shall be subject to verification by Buyer.
- 3.5 CERTIFICATION REQUIREMENTS
- Seller shall furnish all certifications, issued by Seller or Seller's subtier sources, required by the Purchase Order or the clauses herein, with the initial delivery of product(s) on the Purchase Order. On all subsequent delivery of product(s) from the same lot, Seller may, in lieu of providing additional copies of certifications, reference on his shipping documents the date and Buyer Purchase Order on which the certifications were initially supplied. Seller is responsible for verifying certifications furnished by Seller's subtier sources for their adequacy and compliance to the Purchase Order and the requirements herein. To assure the adequacy and authenticity of all certifications furnished by Seller, the certifications shall include the name of the issuing organization and shall be signed by an official of the issuing organization.
- 3.6 SELLER'S RECORDS - Unless otherwise specified on the Purchase Order, Seller shall retain all required records as objective evidence of conformance to Purchase Order requirements, including Seller's records and certifications of the inspections and test performed in the course of procurement, manufacturing, testing, processing, inspecting, preserving, packaging and shipping product(s) on the Purchase Order, for a minimum of ten (10) years after completion of the order. Such records shall be made available to Buyer for review upon request.
- 3.7 CONTROL OF NONCONFORMING PRODUCTS AND MATERIAL REVIEW
- 3.7.1 SUBMITTAL OF NONCONFORMING MATERIAL - Any product(s) found to be nonconforming to Buyer's drawings, specifications, Purchase Order or other applicable requirements, shall be documented by Seller and submitted to Buyer for disposition by Buyer's Material Review Board (MRB). A Supplier Rejection Report (RR) and instructions for its completion, shall be requested from Buyer and used by Seller to describe the nonconforming conditions and to submit nonconforming product(s) to Buyer's MRB for disposition. Subsequent to Buyer's MRB disposition, a copy of the RR describing the disposition shall be returned to Seller by Buyer. Seller shall not ship to Buyer any nonconforming product(s) pending Buyer's MRB disposition, unless authorized in writing by Buyer. When Buyer's MRB disposition results in acceptance (use-as-is) of Seller's nonconforming product(s), Seller shall reference the serial number of the RR on each shipping document delivering products previously dispositioned by Buyer's MRB. Buyer's MRB dispositioned product(s) shipped concurrently with conforming product(s) shall be segregated to permit identification by Buyer upon receipt.
- 3.7.2 RESUBMITTAL OF REJECTED PRODUCTS - Product(s) rejected by Buyer and resubmitted by Seller shall be clearly identified as resubmitted product(s). Seller's shipping documents shall contain a statement that product(s) delivered are either "replacement" or "reworked" product(s), and shall include reference to Buyer's rejection document number.
- 3.8 CORRECTIVE ACTION AND FAILURE INVESTIGATION
- 3.8.1 CORRECTIVE ACTION - When a quality (system or product) nonconformance is identified by Buyer, Buyer may request a formal corrective action response from Seller. Such requests require a timely and documented response by Seller and shall include the following information:
- Seller's analysis of the root cause of the problem, including a statement explaining why Seller's inspection/quality system failed to detect the nonconformance;
 - When applicable, a statement that Seller's stock or inventory has been reinspected and nonconforming product(s) removed;
 - Description of the positive action taken by Seller to preclude recurrence; and
 - The effectivity (date, serial number, lot, etc.) of the corrective action implemented by the Seller.
- 3.8.2 FAILURE INVESTIGATION - When a product field failure

or malfunction is reported by Buyer, Buyer may return applicable product(s) to Seller and request Seller to conduct a formal failure investigation and analysis to identify the cause of the failure. Such investigation and analysis require a timely and documented response and, when applicable, shall include corrective action as required by 3.8.1.

NOTE: When corrective action and/or failure investigation is required on product(s) applicable to U.S. Government contract or subcontract and Government source inspection has been imposed, Seller shall coordinate the corrective action/failure investigation with the Government Quality Assurance Representative assigned to Seller's facilities.

- 3.9 AERO-K FURNISHED EQUIPMENT - Seller shall be responsible for ascertaining the accuracy and stability of AERO-K furnished equipment used for product acceptance. AERO-K furnished equipment shall be periodically reinspected and calibrated as required to assure continued accuracy.
- 3.10 PRODUCT IDENTIFICATION - All products shall be identified in accordance with drawing, specification, and/or Purchase Order requirements. Unless permitted by drawing, steel stamping and vibro-engraving identification methods are prohibited, except on nameplates or attached metal tags.
- 3.11 RIGHT OF ACCESS – Right of access to all facilities involved in the order and all applicable quality records is allowed for the purchaser, their customer, and regulatory authorities.

4. SPECIAL PRODUCT ASSURANCE REQUIREMENTS CLAUSES

4.1 SELLER'S QUALITY PROGRAM REQUIREMENTS

Q020

BASIC INSPECTION SYSTEM REQUIREMENTS FOR MANUFACTURERS

- Seller shall establish and maintain a documented inspection system that includes provisions for:

- (a) CONTROL OF SUBTIER SOURCES - All products scheduled for delivery to Buyer and procured by Seller from Seller's subtier sources at every tier, shall comply with all applicable provisions of drawings, specifications and other requirements of Buyer's Purchase Order. When Buyer's Purchase Order requires the use of subtier sources approved by Buyer, Seller's system shall assure that only subtier sources currently approved by Buyer are used to procure products or services for use in or on Buyer's Purchase Orders. Use of Buyer specified subtier sources does not relieve Seller of compliance to all applicable product technical and quality requirements.

- (b) RECEIVING INSPECTION - Product(s) purchased by Seller for use in Buyer's Purchase Orders shall be inspected by Seller upon receipt to the extent required to assure conformance to all applicable requirements. Inspected and accepted product(s) shall be adequately identified and/or controlled to prevent commingling with other product(s). Buyer furnished materials shall be inspected to the extent necessary to assure damage was not incurred during transit and shall be identified and segregated for use only in Buyer's Purchase Orders, or as prescribed by Buyer.
- (c) MANUFACTURING CONTROLS - Seller shall employ a system for controlling, documenting and maintaining required product quality levels throughout the manufacturing process whether performed by Seller or Seller's subtier sources. This may be accomplished using a manufacturing plan or outline, shop routing or traveler, or other suitable methods which define the step-by-step sequence of manufacturing operations and inspection points and provide objective evidence that resultant product(s) conform to the specified requirements. When manufacturing and/or inspection plans or operations, or the sequence in which they are to be accomplished, are specified by Buyer on the Purchase Order, Seller's system shall assure compliance to such plans, subject to verification by Buyer's representative.
- (d) CONTROL OF TOOLING AND MEASURING AND TEST EQUIPMENT (M&TE) - Seller shall maintain suitable tools, gages, and M&TE of required accuracy for use during manufacturing and inspection operations to verify product conformance to specified requirements. Such tooling and M&TE shall be calibrated at scheduled intervals, against certified standards which have known valid relationships to National or International Standards. Seller's system for control and calibration of such tooling and M&TE shall be documented and include provisions for compliance to national or international calibration system standards to the extent necessary to maintain required levels of accuracy and assure product conformance to applicable requirements. Control of tooling and M&TE furnished by Buyer shall be the responsibility of Seller.
- (e) CONTROL OF NONCONFORMING PRODUCTS - Seller shall establish a system for prompt identification, segregation, documentation and submittal to Buyer for disposition of any nonconforming product(s) found during Seller's manufacturing or inspection operation, and a system to implement effective corrective action to preclude recurrence. The corrective action system shall provide for prompt notification to Buyer if it is determined that nonconforming material may have been shipped to Buyer
- (f) PREPARATION FOR SHIPMENT - Seller shall assure that product(s) are complete to Purchase Order requirements and that all manufacturing and product inspection and acceptance requirements have been satisfied prior to shipment. Seller shall assure that

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product(s) are packaged in accordance with applicable requirements and are accompanied by the required inspection and technical documents.

of the individual lot, batch, heat number, etc., are maintained from time of receipt by Seller, from Seller's subtier sources, to delivery to Buyer.

Q030

INSPECTION SYSTEM REQUIREMENTS FOR

DISTRIBUTOR/WAREHOUSE - Seller shall establish and maintain a documented system to control product quality and integrity. Seller's system shall include provisions for:

- (a) **CONTROL OF PURCHASES AND SUBTIER SOURCES** - Seller's purchasing or ordering documents shall contain data clearly describing the product(s) ordered, including, when applicable, the type, class, grade, size or (other precise identification), and the title (or other positive identification) and applicable issue of specification(s), drawing(s), or other relevant technical data. When applicable, purchase of products shall be made only from sources specified by Buyer, or sources that are listed as qualified and/or approved manufacturers or distributors of the product on the applicable Qualified Products List (QPL) or Preferred Parts List (PPL). Purchase of product(s) from Buyer specified sources, or sources listed on the applicable QPL or PPL, does not relieve Seller of the responsibility to furnish product(s) that meet all requirements specified by the Purchase Order.
- (b) **INSPECTION** - Seller shall employ receiving, in-process and final inspection and testing to the extent necessary to verify product conformance to all applicable requirements. Inspection records, certifications, test reports and technical data statements of quality shall be maintained by Seller as objective evidence of product quality required by the Order. When required by the Purchase Order, such data shall be furnished to Buyer with delivery of products. Inspection measuring and test equipment (M&TE), when used to verify product conformance, shall be controlled and periodically calibrated in accordance with national or international calibration system standards to the extent necessary to maintain required levels of accuracy. All products found to be nonconforming during Seller's inspection operations shall be properly identified and segregated pending disposition. Seller's inspection system shall provide for prompt notification to Buyer if it is determined that nonconforming material may have been shipped to Buyer.
- (c) **STOCK CONTROL AND TRACEABILITY** - Seller's system shall provide for handling and storage of product(s) in a manner to protect product quality by preventing damage, loss, deterioration, contamination, corrosion, degradation or substitution. Stock control shall be such that it precludes unauthorized withdrawal of product(s). Products from different manufacturing sources shall be stored in a manner so that products do not become intermixed and that the manufacturing source and the identity and traceability

- (d) **PREPARATION FOR SHIPMENT** - Seller's system shall assure that products meet all applicable Purchase Order requirements prior to shipment to Buyer and that product(s) are packaged in accordance with applicable requirements and are accompanied by the required inspection and technical documents
- (e) **ALTERATIONS BY SELLER** - Seller shall not modify, rework or repair product(s) in-house or by subcontracting unless authorized by Buyer in writing or the work is performed by the original manufacturing source of the product(s). When Seller is authorized to perform operations or to make alterations on products to be furnished to Buyer, Seller shall maintain drawings, specifications, technical data and inspection records pertinent to the work being performed. Such records shall be available for Buyer's review upon request.

Q050

INSPECTION SYSTEM PER MIL-145208 - Seller shall establish and maintain an inspection system in compliance with the requirements of MIL-I-45208, "Inspection System Requirements."

Q070

INSPECTION SYSTEM PER FAA FAR PART 21 - Seller shall establish and maintain an inspection system in compliance with the requirements of Federal Aviation Administration (FAA) Regulation (FAR) Part 21, "Certification Procedure for Products and Parts."

Q080

INSPECTION SYSTEM PER FAA FAR PART 145 - Seller shall establish and maintain an inspection system in compliance with the requirements of Federal Aviation Administration (FAA) Regulation (FAR) Part 145, "Repair Stations; Inspection System Requirements."

Q090

QUALITY PROGRAM PER MIL-Q-9858 - Seller shall establish and maintain a quality program in compliance with the requirements of MIL-Q-9858, "Quality Program Requirements."

Q110

QUALITY PROGRAM PER ISO 9001 - Seller shall establish and maintain a quality program in compliance with the requirements of International Standard ISO 9001.

Q140

CALIBRATION SYSTEM PER MIL-STD-45662 - Seller shall establish and maintain a calibration system in compliance with the requirements of MIL-STD-45662, "Calibration System Requirements."

Q141

CALIBRATION PROGRAM PER ISO 10012-1 - Seller shall establish and maintain a calibration system in compliance with the requirements of International Standard ISO 10012-1, "Quality

Assurance Requirements for Measuring Equipment."

Q143

CALIBRATION SYSTEM PER ISO/IEC 17025 - Seller shall establish and maintain a calibration system in compliance with the requirements of ISO/IEC 17025, "Calibration System Requirements."

Q145

CALIBRATION SYSTEM PER ANSI Z540-1 - Seller shall establish and maintain a calibration system in compliance with the requirements of ANSI Z540-1, "Calibration System Requirements."

Q150

CONTROL OF NONCONFORMING MATERIAL PER MIL-STD-1520 - Seller shall establish and maintain a system for control of nonconforming material in compliance with the requirements of MIL-STD-1520, "Corrective Action and Disposition System for Nonconforming Material."

Q155

SELLER'S LIMITED MATERIAL REVIEW AUTHORITY - Seller's material review authority is limited to disposition of "rework" 'scrap' or 'RTV' (return to vendor). Seller's Material Review Board (MRB) may not render a disposition of 'use-as-is' and/or 'repair' on any products found to be nonconforming, whether such products are within the proprietary design authority of the Seller or Seller's sub-tier sources. Seller may propose a 'use-as-is' and/or 'repair' disposition including appropriate justification to the Buyer. Such requests shall be documented by the Seller and submitted to the Buyer for disposition by Buyer's Material Review Board (MRB) in accordance with the requirements of section 3.7.1 herein. For the purpose of this clause, nonconforming products are defined as products which fail to meet the requirements of the drawing, specification, or other approved product description, including Seller's proprietary documents. Upon request, Seller's manufacturing and inspection records shall be made available to the Buyer for the purpose of determining compliance to the requirements of this clause.

Q160

SELLER'S MATERIAL REVIEW AUTHORITY - Seller is delegated material review authority to disposition Seller's proprietary design product(s) with minor nonconformances. Minor nonconformances are defined as nonconformances which do not adversely affect health or safety, performance, interchangeability, reliability, maintainability, effective use or operation, or weight or appearance when a factor. All Buyer specified requirements are defined as major, and disposition is limited to Buyer's Material Review Board. Seller's material review authority is contingent on Seller having an established and documented material review system that provides for a technically competent Material Review Board (MRB), chaired by Quality. Seller's material review system shall include provisions for nonconformance feedback to product design, quality analysis and evaluation, and for positive corrective action to preclude recurrences. Seller's records of material review actions and corrective action shall be available for review by Buyer's Quality Assurance representative(s).

4.2 SOURCE INSPECTION REQUIREMENTS

Q180

IN-PROCESS SOURCE INSPECTION - Products to be delivered under the Purchase Order require in-process source inspection, tests, or both, by Buyer's Quality representative at the points specified in the Purchase Order. Seller shall notify Buyer at least forty-eight (48) hours in advance of the time the product will be ready for in-process inspection. Seller's measuring and test equipment, facilities, and personnel shall be made available for use by Buyer's representative when requested.

Q190

FINAL SOURCE INSPECTION - Products to be delivered under this Purchase Order require final source inspection, tests or both, by Buyer's Quality representative prior to delivery to Buyer. Seller shall notify Buyer at least forty-eight (48) hours in advance of the time product will be ready for final inspection. Seller's measuring and test equipment facilities, and personnel shall be made available for use by Buyer's representative when requested.

Q200

GOVERNMENT SOURCE INSPECTION (GSI) - Government Source Inspection (GSI) is required prior to shipment from Seller's plant. Upon receipt of this Purchase Order, Seller shall promptly notify the Government representative who normally services Seller's plant so that appropriate planning by the Government representative can be accomplished for inspection at Seller's plant. If Seller cannot locate or contact the Government representative, Seller shall notify Buyer immediately.

Q210

GOVERNMENT SOURCE INSPECTION (GSI)-NASA CONTRACTS - During performance on this Purchase Order, all work is subject to source inspection and/or test by the cognizant Government representative. Seller shall assure that the Government representative who has been delegated NASA Quality Assurance Source Inspection functions on this Order at Seller's plant is notified immediately upon receipt of this Purchase Order and a minimum of forty-eight (48) hours in advance of the time any product(s) will be ready for Government inspection, verification and/or test. If Seller cannot locate or contact the Government representative, Seller shall notify Buyer immediately.

Q220

GOVERNMENT SURVEILLANCE AT SELLER'S FACILITIES-NASA CONTRACTS - During performance on this Purchase Order, Seller's facilities, procedures, systems and all work being performed are subject to surveillance by the Government representative delegated NASA Quality Assurance functions at Seller's facilities. Upon receipt of this Purchase Order, Seller shall notify the cognizant Government representative immediately. If Seller cannot locate or contact the Government representative, Seller shall notify Buyer immediately.

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FAA INSPECTION - FAA (Federal Aviation Administration) inspection and/or authorization is required for shipment of product(s) from Seller's plant. A completed FAA Airworthiness Approval Tag (FAA Form 8130-3) is required and shall be submitted with shipment of part(s) or material to Buyer. The 8130-3 tag may be issued by Seller's FAA approved Designated Material Inspection Representative (DMIR) or Organizational Designated Airworthiness Representative (ODAR), or Seller may contact the FAA for assistance. If the FAA cannot be contacted, Seller shall notify Buyer immediately.

4.3 STATEMENTS OF QUALITY

Q235

PURCHASE ORDER LINE ITEM AND RELEASE NUMBER

Seller shall place on the packing slip/shipper and the Certificate of Conformance (Q240 or Q245) the Purchase Order number, line item number and release number.

Q240

CERTIFICATE OF CONFORMANCE (COC) - Seller shall provide, on the packing list/shipper or on a separate document, a written statement that all supplies and/or services comply with all requirements of the Purchase Order. Certificate(s) of Conformance shall comply with section 3.5 herein and, as a minimum, shall contain the part number, revision, packing list/shipper number, and AERO-K Purchase Order number.

Q250

CERTIFICATE OF TRACEABILITY (COT) - Seller shall provide, on the packing list/shipper or on a separate document, a written statement that:

- (a) all products and/or services were purchased directly from the manufacturer or one of the manufacturer's authorized distributors;
- (b) the attached manufacturer's certification/test report is a true and correct copy of the original certification/test report issued by the manufacturer and covers product(s) delivered on this Purchase Order; and
- (c) the product(s) have not been reworked, reprocessed or modified by Seller in any manner except as specified below and/or required by the Purchase Order.

Certificate(s) of Traceability shall comply with section 3.5 herein and, as a minimum, shall contain part no., revision., packing list/shipper number, and AERO-K Purchase Order No.

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TOXIC SUBSTANCES (TSCA) LIABILITY DISCLAIMER – THE SELLER SHALL CERTIFY THAT THE PRODUCT PURCHASED BY AERO-K ON THIS PURCHASE ORDER CONTAINS ONLY CHEMICALS WHICH ARE LISTED ON THE (TSCA) TOXIC SUBSTANCES REGISTRY AS SPECIFIED UNDER FEDERAL REGULATIONS.

Q270

MERCURY FREE CERTIFICATION - Seller shall provide, on the packing list/shipper or on a separate document, a written statement that all products and/or services provided have not come in contact with or have been exposed to mercury bearing instruments or equipment, or mercury in any other form. This certification shall comply with section 3.5 herein and, as a minimum, shall contain part number, revision, packing list/shipper number, and AERO-K Purchase Order number.

Q280

CONTROL OF FASTENERS CERTIFICATION - With each shipment of fasteners, Seller shall furnish documentation that identifies the fastener manufacturer and the manufacturer's production lot or batch number. In addition, Seller shall certify that the manufacturer (or other source) of the fasteners is not currently listed as a "debarred, suspended, or ineligible contractor" on the current issue of the "lists of parties" published by the U.S. Government, General Services Administration (GSA). For additional information and resolution of questions, contact Buyer.

4.4 RAW MATERIAL TEST REPORTS

Q290

RAW MATERIAL TEST REPORTS - For each lot or heat of material supplied on this Purchase Order, Seller shall furnish a certified material test report meeting the requirements of section 3.5 herein and listing the material description, including, as applicable, the material name or designation, alloy, type, class, grade or condition, producer's (mill) name, the lot or heat number, and the material specification and revision to which the material complies. In addition, for:

- (a) **FERROUS MATERIALS** - Furnish a listing of the actual values of chemical composition and physical properties obtained from the lot or heat versus values required by the applicable material specification.
- (b) **NONFERROUS MATERIALS** - Furnish a listing of the typical range of values (unless actual values are required by the applicable material specification or the Purchase Order) of the chemical composition and physical properties of the material, and a statement that the material supplied conforms to the requirements of the applicable material specification.
- (c) **NONMETALLIC MATERIALS** - Furnish a certification issued by the manufacturer of the material listing the material designation and nomenclature, the material size, the specification and revision to which the material conforms, the lot number or designation (if applicable), the date manufactured, the manufacturer's identity, and any other deliverable technical data (test results, composition, chemical or physical properties, etc.) required by the applicable specification or the Purchase Order.

AERO-K, INC.

SUPPLIER FLOW-DOWN REQUIREMENTS (FDR)

REV. E

Q300

HEAT LOT QUANTITY AND SIZE REQUIREMENTS – The number of heat lots allowed per Aero-K Purchase Order line item is limited to one (1) and only one (1) total heat lot for the entire quantity ordered.

Q310

BUYER FURNISHED RAW MATERIAL - Strict accountability of material furnished by Buyer shall be maintained by Seller. In the event that more than one lot or heat of material is furnished to Seller, Seller shall maintain individual material lot integrity and provide positive traceability of material lot/heat numbers to the specific product(s) delivered. Seller shall provide, on the packing list/shipper or on a separate document, a statement that:

- (a) all product(s) delivered on this Purchase Order were manufactured:
 - (1) from material furnished by Buyer, and
 - (2) from the material heat or lot number(s) identified on the material and/or Buyer's shipper to Seller, and
- (b) no material substitution was made by Seller.

Seller's statement shall meet the requirements of section 3.5 herein and, as a minimum, shall contain the part number, revision, packing list/shipper number, and AERO-K Purchase Order number.

Q320

SELLER FURNISHED RAW MATERIAL - With each delivery of product(s), Seller shall furnish the material certifications/test reports covering the material used to fill this order. The material certifications/test reports shall comply with the applicable requirements of (a) through (c) specified in Clause Q290 herein for the type of material furnished. In the event that more than one lot or heat of raw material is used by Seller, each fabricated lot of products shall be identified and/or packaged in separate lots to maintain traceability and integrity to the applicable material certifications/test reports. Each certification/test report shall comply with section 3.5 herein and, as a minimum, shall contain part number, revision, packing list/shipper number, and AERO-K Purchase Order number.

Q330

RAW MATERIAL TRACEABILITY, IDENTIFICATION AND CONTROL - Seller shall provide positive traceability of all products delivered, including serial numbers (if applicable), to the material certifications/test reports of the specific raw material from which each of the products was manufactured. Traceability may be provided by identifying individual product(s) with the material producer's heat lot number, batch or melt, or a unique identifier assigned by Seller which is cross-referenced to the material certification/test report. Products with insufficient surface area for marking may be packaged in separate lots or individual packages or have tags attached which identify the raw material lot numbers.

4.5 CONTROL OF SPECIAL PROCESSES

Q340

QUALIFIED SOURCES AND PROCESS CERTIFICATIONS -

- (a) **PROCESSES REQUIRING USE OF QUALIFIED SOURCES** - Unless otherwise specified by the Purchase Order, all chemical, metallurgical, nondestructive or any other special manufacturing or inspection processes of product(s), controlled by Military, Government, Industry or AERO-K specification, shall be performed only by sources currently approved for the process by Buyer. If the process is performed and controlled by a specification issued by Seller or Seller's subtier source, Seller shall furnish a copy of the controlling specification to Buyer for approval, subject to proprietary considerations. The process approval requirements apply whether the work is being performed by Seller or Seller's subtier source. Use of unapproved process sources shall result in rejection and return of product(s) to Seller at Seller's expense. For a list of currently qualified and approved process sources, contact Buyer.
- (b) **PROCESS CERTIFICATIONS** - For all special processes required by the Purchase Order or reference documents and performed by Seller or Seller's subtier source, Seller shall furnish the certification/test report issued by Seller or Seller's subtier source that actually performed the process. The certification/test report shall meet the requirements of section 3.5 herein and shall, as a minimum, include a complete description of the special process performed (process name, applicable specification and revision, type, class, grade, etc.), the quantity and description (part number and name) of the product, and, when applicable, a statement that the process was performed by certified operator(s).

Q341

DFARS MATERIAL QUALIFICATION -

Specialty metals must be melted in the United States or a qualifying country, or they can be melted anywhere but must be "incorporated in an article manufactured in a qualifying country". The clause allows a qualifying country to manufacture parts from metal that was melted anywhere, provided it meets specifications, but Aero-K can only use metal that was melted in the United States or a qualifying country.

As of the date of this requirement, the qualifying countries are Australia, Belgium, Canada, Denmark, Egypt, Germany, France, Greece, Israel, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and Northern Ireland.

Q342

NADCAP ACCREDITATION - Special processes shall be performed by sources that are accredited by the National Aerospace and Defense Contractors Accreditation Program (NADCAP). This requirement applies whether the process is performed by Seller or by Seller's subtier sources. Use of unaccredited process sources shall result in rejection and return

AERO-K, INC.

SUPPLIER FLOW-DOWN REQUIREMENTS (FDR)

REV. E

of product(s) to Seller at Seller's expense. For a list of NADCAP accredited processors, contact the Buyer.

Q345

CONTROL OF STRIPPING AND REPLATING - Stripping and replating of product(s) requires prior written authorization when any one or more of the following condition exist:

- (a) Parts having a hardness requirement of 220 KS or less have been previously stripped and replated, and/or
- (b) Parts have a hardness requirement greater than 220 KSI.

Note: Additional stripping and replating after initial authorization by Buyer require resubmittal to Buyer for approval in writing prior to performance of work.

Q350

HEAT TREAT CERTIFICATIONS - With each shipment of product(s), Seller shall furnish a time/temperature certification that contains, as a minimum, time in and time out, duration, and temperature range.

Q360

HEAT TREAT FURNACE CHARTS - In addition to the actual time/temperature certification required by Clause Q350, Seller shall furnish with each shipment of product(s) original or legible copy of the actual furnace temperature charts.

Q370

TEST SAMPLES - Seller shall furnish for Buyer verification testing one (1) additional product or suitable test sample of the same material lot and processed simultaneously with the lot of product(s) supplied on this Purchase Order. Both the test sample and Seller shipping documents shall identify the sample, part number, process and batch or lot number

Q380

NONDESTRUCTIVE TEST (NDT) REPORTS - With each shipment of product(s), Seller shall furnish the certified test report for all nondestructive testing (NDT) (e.g., penetrant, magnetic particle, radiographic, ultrasonic) performed. The report shall be issued by the organization that actually performed the NDT and shall include a complete description of the test, test name, specification, revision, type, method, and acceptance criteria document number and revision. The test report shall meet the requirements of section 3.5 herein. When applicable, radiographic reports shall be accompanied by a shooting sketch and the exposed film. When products are serialized or identified with a lot or batch number, such identification shall appear on the NDT reports and exposed radiographic film.

Q390

NDT TECHNIQUE APPROVAL - Prior to conducting any nondestructive testing (NDT), Seller shall submit to Buyer for approval a detailed written procedure describing the NDT to be performed. The procedure shall include all necessary information including pictures or sketches, materials, tooling and/or equipment to be used, safety precautions, and any

other pertinent information required to successfully conduct the NDT operation. The procedure shall be identified with a number, the applicable NDT specification and revision to which it applies, and the signature and date of the qualified technician who prepared the NDT technique. Any changes to Buyer approved NDT techniques shall be submitted to Buyer for approval prior to their use.

Q400

WELD SCHEDULE APPROVAL - Prior to performing any welding Seller shall submit to Buyer for approval a detailed written weld schedule. The weld schedule shall identify the part number and revision, the applicable weld specification and revision, and the qualified welder(s).

4.6 CONTROL OF CASTINGS

Q410

FOUNDRY CONTROL REQUIREMENTS - Prior to making the first production run of any new castings or castings for which new tooling (patterns or molds) have been made; or when a change is made in gates, risers, chills or as-cast shape; or when a pattern or mold is transferred to a different facility or supplier, Seller shall establish foundry control and submit to Buyer, for review and approval, the following:

- (a) **FIRST ARTICLE CASTING(S)** - Sample foundry control casting(s) from the first production run and representative of practices and processes to be used on production castings. The quantity of foundry control castings shall be as required by the Purchase Order or applicable specification, and shall be in addition to the production quantities required by the Purchase Order
- (b) **MECHANICAL PROPERTIES** - The laboratory test report or certified statement of the test bar mechanical properties from the foundry control First Article casting(s). The test bar(s) shall be from the same melt and heat treat as the foundry control casting(s)
- (c) **CHEMICAL COMPOSITION** - The laboratory test report or certified statement of chemical analysis of the material (melt) used in the foundry control First Article casting(s) showing the actual percentage of each element contained in the specimen.
- (d) **RADIOGRAPHIC FILM (X-RAY)** - The shooting sketch and exposed film of the foundry control First Article casting(s). Seller shall submit Seller's radiographic technique with the exposed film to Buyer for review and approval.

Q420

PRODUCTION CASTINGS - With the delivery of each heat lot or melt of production castings, Seller shall furnish to Buyer the certifications/test reports required by the "Q"

Clauses listed below:

- Q320 Seller Furnished Raw Material
- Q340 Qualified Sources and Process Certifications
- Q350 Heat Treat Certifications
- Q380 Nondestructive Test (NDT) Reports

4.7 CONTROL OF FORGINGS, EXTRUSIONS AND PRESSINGS

Q430

FORGING CONTROL - Prior to making the first production run, Seller shall submit to Buyer, for review and approval, the following:

- (a) **FIRST ARTICLE(S)** - Sample forging(s), extrusion(s), or pressing(s) from the first production run and representative of all processing to be used in production. The quantity shall be as required by the Purchase Order or applicable specification, and shall be in addition to the production quantities required by the Purchase Order
- (b) **MECHANICAL PROPERTIES** - The laboratory test report or certified statement of the test bar mechanical properties from the forging lot
- (c) **CHEMICAL COMPOSITION** - The laboratory test report or certified statement of chemical analysis of the material used in the First Article forging(s) showing the actual percentage of each element contained in the specimen.
- (d) **ULTRASONIC TECHNIQUE** - The written technique used to perform the ultrasonic inspection.
- (e) **NONDESTRUCTIVE TEST (NDT) REPORTS** - The NDT report certifying acceptance of the First Article forging(s).

Q440

PRODUCTION FORGINGS - With the delivery of each heat lot of production forgings, Seller shall furnish to Buyer the certifications/test reports required by the "Q" Clauses listed below:

- Q320 Seller Furnished Raw Material
- Q340 Qualified Sources and Process Certifications
- Q350 Heat Treat Certifications
- Q380 Nondestructive Test (NDT) Reports

4.8 CONTROL OF AGE SENSITIVE ITEMS

Q450

ELASTOMERS (RUBBER GOODS) - Unless otherwise specified on the Purchase Order or reference documents, age control of elastomers and elastomer material (O-rings, seals, gaskets and other rubber goods) shall conform to the requirements of MIL-STD-1523. Seller shall have an effective system of age control of elastomeric components for which acceptability is limited by the age of the elastomer. The system shall include a method of identifying the age of such elastomeric components and provisions for rotation of stock. Products, subassemblies or assemblies containing elastomeric components per MIL-STD-1523 shall be identified by marking on the product(s) the cure date (quarter and year) of the oldest elastomeric component contained therein.

Q460

LIMITED SHELF LIFE MATERIAL(S) - On each container of, and on the certification for, material(s) having a limited or specified shelf life, Seller shall show the cure or manufacture date, expiration date or shelf life, lot or batch number and, when applicable, any special storage or handling conditions. The information shall be in addition to the normal identification requirements of the drawing, specification and/or Purchase Order. Time lapse between cure or manufacture date of such material(s) and date of scheduled receipt by Buyer under the Purchase Order shall not exceed one-third (1/3) of the shelf life for the material without prior written waiver from Buyer for each shipment.

4.9 CONTROL OF ELECTRONIC DEVICES AND COMPONENTS

Q470

ELECTROSTATIC PROTECTION CONTROL PROGRAM - Prior to processing production hardware, Seller shall establish, implement and submit to Buyer for review and approval, including on-site examination as appropriate, an Electrostatic Discharge (ESD) control program in accordance with the requirements of MIL-STD-1686. Seller shall package all products susceptible to damage from ESD as determined in accordance with MIL-STD-1686, Appendix A, in static shielding conductive containers per MIL-B-81705. Protection shall be provided to prevent physical damage and to maintain leads and terminals in the manufactured condition under handling and transportation environments. The outside package containing ESD sensitive items shall have an ESD warning label conforming to MIL-STD-129. This same label shall be used to seal shielded bags.

Q480

PROTECTION OF ELECTROSTATIC SENSITIVE DEVICES - All voltage sensitive devices and/or subassemblies and assemblies containing such devices shall be protected from static electricity and transient voltages in accordance with the requirements specified on the drawing or specification for which the devices are procured.

Q490

CERTIFICATIONS AND TEST REPORTS - With each shipment of electronic devices and/or components, Seller shall submit certifications traceable to the manufacturing and/or screening process. Certifications and other applicable documents shall meet the requirements of section 3.5 herein and shall indicate the applicable specification, revision, part number, manufacturer's identity, and manufacturer's lot and date code.

Q500

IDENTIFICATION - Each electronic device or component furnished shall be identified in accordance with applicable specification by lot or batch, traceable to the actual manufacturing process. The lot or batch number may be a date or supplier shop order code, and shall provide the capability for lot or batch to be effectively screened to remove defectives in the event of determination of a discrepant condition.

Q510

PRINTED WIRING - With each shipment of printed wiring to Buyer, Seller shall furnish the following:

- (a) One (1) sample board from each "plating lot" represented in any shipment to Buyer. The sample board(s) shall be clearly identified and traceable to the plating lot(s). Sample boards may be taken from electrical or other rejects identified by Seller.
- (b) Rigid printed wiring that conforms to the quality assurance provisions of MIL-P-55110, including Group "A" and "B" inspections.
- (c) Flexible and rigid/flex printed wiring that conforms to the quality assurance provisions of MIL-P-50884, including Group "A" and "B" inspections. Unless otherwise specified, electrical test per Group "A" inspection of MIL-P-50884 shall be limited to Types 3, 4 and 5.
- (d) Seller's certification of test for electrical continuity for all multi-layer boards.

4.10 CONTROL OF CONTAMINATION AND FOREIGN OBJECT DAMAGE CLAUSES

Q520

FOREIGN OBJECT DAMAGE (FOD) CONTROL PROGRAM - Seller shall establish, document and maintain a program to control and eliminate Foreign Object Damage (FOD) and/or contamination during Seller's (or Seller's sub-tier source's) manufacturing, assembly, test and inspection operations. Seller's FOD program is subject to on-site review and approval by Buyer.

Q530

FOD CERTIFICATION - Seller shall provide, on the packing list/shipper or on a separate document, a written statement that all suppliers and/or services provided have been controlled and examined in accordance with applicable requirements of the Seller's Foreign Object Damage (FOD) control program. The statement shall meet the requirements of section 3.5 herein, and objective evidence to support the statement shall be available for Buyer review upon request.

4.11 INSPECTION AND TEST REPORTS

Q540

FIRST ARTICLE INSPECTION AT SELLER'S FACILITIES - Buyer inspection and acceptance of First Article product(s) is required prior to delivery to Buyer. Each First Article product shall be completely processed per Purchase Order and clearly identified as a First Article sample. Seller shall notify Buyer sufficiently in advance so that inspection of the First Article, with documentation, can be scheduled at Seller's facility prior to the Purchase Order specified delivery due date.

Q545

11/19/12 QF FDR, Rev. E
Approved by QAM

AS9102 FORMAT FOR FIRST ARTICLE INSPECTION REPORTS

Seller shall provide First Article reports formatted in compliance with the current revision of AS9102 Rev A, Part Number Accountability requirements.

Q550

FIRST ARTICLE INSPECTION AT BUYER'S FACILITIES -

Buyer's inspection and acceptance of First Article product(s) is required prior to Seller's delivering the production order. Each First Article product shall be completely processed per Purchase Order and clearly identified as First Article sample and submitted to Buyer's Receiving Inspection for test and/or inspection.

Q560

SELLER'S FIRST ARTICLE INSPECTION REPORTS -

Concurrent with delivery of first production product(s) and First Article sample(s), Seller shall submit to Buyer a First Article Inspection Report documenting the results of Seller's First Article test and/or inspection. The First Article Inspection Report shall show the actual dimensions or values obtained by Seller for each specified characteristic and evidence of compliance to all engineering drawing notes.

Q565

FIRST ARTICLE INSPECTION OF SELLER DESIGNED PRODUCTS -

Concurrent with delivery of first production product(s) and First Article sample, Seller shall submit to Buyer a First Article Inspection Report documenting the results of Seller's First Article test and/or inspection of the product and each sub-tier component. The First Article Inspection Report shall show the actual dimension or values obtained by Seller for each specified characteristic and evidence of compliance to all engineering drawing notes.

Q570

100% INSPECTION - Seller shall perform 100% inspection of all characteristics on all products covered by the Purchase Order. Records of Seller's 100% inspection results showing actual values shall accompany each delivery of product(s) to Buyer.

Q580

SUPPLIER INSPECTION REPORT (SIR) - Buyer shall provide Seller with blank copies of Supplier Inspection Reports (SIRs) defining the specific product inspection to be accomplished by Seller on this Purchase Order. Seller shall perform the required product inspection and record actual results (dimensions, values, etc.) on the SIR and submit the SIR, signed by Seller's representative responsible for Quality, with each shipment of product(s) to Buyer.

Q590

FINAL INSPECTION REPORTS AND RECORDS - With each delivery of product(s), Seller shall furnish a copy of Seller's final inspection report(s) and/or record(s) showing the actual results (dimensions, values, etc.) obtained by Seller during final inspection of delivered product(s).

Q600

PRODUCT SERIALIZATION - Serial numbers for all products on this order shall be assigned by Buyer, applied on all products, and recorded on all applicable documentation by Seller. The assigned serial numbers shall not be altered or replaced without prior written authorization from Buyer.

Q610

ACCEPTANCE TEST PROCEDURE (ATP) APPROVAL - Quality conformance and/or acceptance tests in compliance with a documented and approved procedure are the final tests performed by Seller to assure compliance of Seller's product(s) to all Buyer specified performance requirements. At least thirty (30) days prior to initial usage of such quality conformance and/or ATP in production, Seller shall submit a copy of the procedure, including any test diagrams or sketches necessary for interpretation, to Buyer for review and approval by Buyer's Design and Quality Engineering.

Q620

FUNCTIONAL TEST DATA - Seller shall furnish the actual product functional test results (data sheets) recording the actual readings for each test parameter specified by the engineering drawing, acceptance test procedure (ATP), specification or Purchase Order. Test reports shall be identifiable to the individual product(s) and/or lot, shall meet the requirements of section 3.5 herein, and shall be signed and/or stamped by Seller's authorized product quality representative.

Q630

FUNCTIONAL TEST REPORTS - With each shipment of product(s), Seller shall submit a test report meeting the requirements of section 3.5 herein and certifying that all tests required by the applicable specification, acceptance test procedure (ATP), engineering drawing or Purchase Order were performed and all products delivered meet the specified functional requirements.

Q640

REGISTERED COMPONENT(S) - The component(s) ordered on this Purchase Order is (are) defined as critical component(s) whose failure in operation would most probably be catastrophic and therefore require strict controls and traceability throughout the manufacturing process. Prior to start of production, Seller shall submit to Buyer for review and approval a written plan describing Seller's control procedure. The plan shall describe in detail Seller's controls of items (a) through (f) below. Subsequent to Buyer approval of Seller's plan, any changes in the plan that may affect any of the items (a) through (f) below shall be submitted to Buyer for review and approval prior to incorporation into Seller's plan.

- (a) Sequence of manufacturing operations
- (b) Method and type of special processing such as heat treat, plating, welding, NDT, etc., to be used
- (c) The points during (a) and (b) above at which inspections and/or tests will be accomplished
- (d) The product attributes that will be inspected at (c) above
- (e) Methods of identification, preservation and packaging

- to be used
- (f) Handling and transportation precautions required

Q650

QUALIFIED PARTS - Items furnished on this Purchase Order shall be only those items that have been listed on, or approved for listing on, the applicable Qualified Products List (QPL) or Preferred Parts List (PPL) of the applicable specification(s).

4.12 MISCELLANEOUS REQUIREMENTS CLAUSES

Q660

MANUFACTURER'S CATALOG, DRAWING, ETC. - With the initial shipment of product(s), Seller shall furnish one (1) copy each of the manufacturer's catalog, drawing or blueprint fully descriptive of the product(s) supplied on this Purchase Order.

Q670

BOEING COMPANY H900 CLAUSE. BDS Terms and Conditions. General Provisions.

In regards to Supplying Raw Material. Material shall be provided to Aero-K in accordance with BAC H900. If you do not have access to this clause, Aero-K will provide upon request.