

Title Supplier Quality Requirements		Book Identification Quality Requirements Manual	Number Control QRP 0541.07 Appendix A
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Flowdown from Quality Systems Manual			

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1.0 PURPOSE

- 1.1 The following supplier quality requirements are made applicable by reference on the Kaman Aerospace Corporation, Kaman Precision Products, Middletown, CT or Kaman Precision Products, Inc., Orlando, FL. purchase order. "KAMAN" as used in this procedure refers to Kaman Aerospace Corporation, Kaman Precision Products Middletown, CT and Kaman Precision Products Inc., Orlando, FL.

2.0 SCOPE

- 2.1 The requirements listed under paragraph 5.0 of this document apply as specified on the purchase order. The supplier in his purchasing documents, to all sub-tier suppliers, must flow requirements listed under paragraph 5.0 as specified on the Kaman purchase order to all sub-tier suppliers. These requirements supplement, but do not supersede the terms and conditions of the purchase order. Failure to comply with requirements shall prohibit acceptance of the shipment and invoice payment.

3.0 RESPONSIBILITY AND AUTHORITY

- 3.1 QA Engineering
Supplier Chain Management
- 3.3 Inspection

4.0 DEFINITIONS

- 4.1 None

5.0 REQUIREMENT PARAGRAPHS:

5.1 INSPECTION AND DOCUMENTATION:

Articles defined in this purchase order are subject to inspection when received and will not be accepted if the supplier fails to provide the documentation and items specified in the purchase order.

Suppliers must have written authorization from Kaman to ship deviated items using

form QAF05-12, "Supplier Request for Variation" (SRV). Deviated parts shall be segregated and identified by the supplier. The SRV must be dispositioned and signed by Kaman Engineering/Quality prior to shipping parts. A copy of the signed and dispositioned SRV must accompany the shipment. Deviated parts shall be tagged with the SRV number.

5.2 GOVERNMENT SOURCE INSPECTION:

Government Source Inspection is required prior to shipment from your plant. Upon receipt of this order, promptly (not later than forty-eight (48) hours) notify and furnish a copy to the Government representative who normally services your plant so that appropriate planning for Government inspection can be accomplished. Verification by the Government and or Kaman customer will not be used by Kaman as evidence of effective control of quality by the supplier, and does not constitute product acceptance by Kaman. If a Government representative does not service your plant, contact the nearest Army, Navy, Air Force, or Defense Supply Agency inspection office. In the event the representative or office cannot be located, Kaman purchasing agent shall be notified immediately.

5.3 KAMAN SOURCE INSPECTION:

Items covered by this purchase order are subject to surveillance and inspection at points of manufacture specified by Kaman Quality Assurance Department. Hardware shall not be delivered without a Source Inspection & Test Surveillance Record (QAF 06-01) signed and stamped by a Kaman Supplier Quality Engineer or a copy of a waiver (QAF 05-31) signed by an authorized Kaman Quality Representative. Suppliers located within the States of Connecticut or Florida shall provide a minimum of three (3) working days advanced notice for source inspection. Suppliers located outside the States of Connecticut or Florida shall provide a minimum of ten (10) working days advance notice for source inspection.

5.4 **Delete**

5.5 **Delete (Moved to 5.42)**

5.6 CERTIFICATION OF COMPLIANCE FURNISHED:

The supplier shall furnish a "Certificate of Compliance" with each shipment that assures full conformity with the PO requirements. The C of C shall list the PO #, applicable drawings, Lot #, Batch, Date Code and specifications, as applicable. The certificate shall be validated and signed by an authorized supplier representative.

NOTE: Electronic signature with original on file is acceptable.

Supplier test reports and inspection records shall be maintained on file at the supplier or manufacturer's facility for **ten (10) years** after completion of the contract, unless otherwise stated on the PO. Reports and records shall be made available for review upon request.

Exception to record retention will be JPF program suppliers shall retain Inspection and test records for (20) years.

Certificate of Compliance verification, validation Raw Material and Process

Supplier shall validate every Sub-tier Supplier C of C to demonstrate Material received is compliant to drawing requirements and specifications, Sub-tier Suppliers test reports and inspection records shall be maintained on file at the supplier or manufacturer's facility for **ten (10) years** after completion of the contract, unless

otherwise stated on the PO. Reports and records shall be made available for review upon request.

Exception to record retention will be JPF program suppliers shall retain Inspection and test records for (20) years.

CERTIFICATE OF COMPLIANCE FURNISHED FROM DISTRIBUTORS:

Electronic Components:

The distributor shall furnish a Certificate of Compliance from the Original Equipment Manufacturer with each shipment that assures full conformity with the PO requirements. The C of C shall be traceable to the Kaman PO#, list applicable drawings, Lot Number, Batch, Date Code and specifications as applicable. The certificate shall be validated and signed by an authorized OEM representative.

NOTE: Electronic signature with original on file is acceptable.

When sub-tier or OEM, C of C validation is not feasible from the original manufacturer, the seller must notify the Kaman buyer at the time of quotation or prior the acceptance of the order and the shipment of the material, for the additional requirements which the Seller must perform, in order to certify the validity of the component and to allow for the acceptance and use by Kaman.

Supplier test reports and inspection records shall be maintained on file at the supplier or manufacturer's facility for **ten (10) years** after completion of the contract, unless otherwise stated on the PO. Reports and records shall be made available for review upon request.

Exception to record retention will be JPF program suppliers shall retain Inspection and test records for (20) years.

Supplier shall enforce controls to assure **all** design construction, components, fabrication, material, processing methods **changes**, facility relocation, **management changes, change in sub-tier suppliers, or changes that may impact form-fit-function-performance-durability** have not changed **since the last** successful Qualification, **First Article Inspection, on-site survey, SSE, and Customer notification**, Any such changes must be communicated, in advance of being implemented, to the appropriate Kaman Buyer, in order for Kaman and/or our Customers to review and communicate requirements which may be placed on the supplier/sub-tier supplier, for qualification and approvals of said change (before it can be introduced into the product).

5.7 PHYSICAL AND CHEMICAL ANALYSES:

- a. The items or services addressed on this order require copies of actual chemical and physical test results showing actual readings taken, and conformance to applicable specifications. These documents shall be included with each shipment.

NOTE 1: When requirement paragraph 7 is specified on the purchase order without suffix a or b, paragraph 7a applies.

- b. For non-ferrous parts and non-ferrous raw material, the material identification and applicable specification are required on the certificate of conformance in lieu of

actual physical and chemical analysis data.

5.8 INSPECTION/TEST DATA REQUIRED:

A copy of inspection and/or test data (including time/temperature charts and SPC charts, if required) shall be supplied with each shipment identifiable to the serial numbers and/or date code of items supplied. The reports shall be validated and signed by an authorized supplier representative.

NOTE: For Heat Treat hardness testing, Kaman authorizes statistical sampling in accordance with SAE AMS2759, unless otherwise specified in this purchase order.

Supplier shall perform inspection and/or acceptance tests and supply data for the appropriate requirements. Inspection and/or acceptance test reports shall reference a purchase order number, supplier's name and address and/or independent laboratory name and address, part number, serial number, if applicable, date and run time. These reports shall accompany each shipment to be delivered and shall be validated by an authorized supplier representative.

- (a) **Attribute Results:** List each inspection and test attribute with the corresponding specification limit(s). Record the number of items inspected, the number accepted, and the number rejected, if sampling plan is used. Indicate the plan used and the related accept/reject criteria.
- (b) **Variables Results:** Record inspection and test measurements for each item inspected or tested. Variables inspection data is applicable to the extent specified on the applicable drawing or in the purchase order.

5.9 TEST SAMPLES-FABRICATED PARTS, ASSEMBLIES, FLEXIBLE CIRCUITS AND PRINTED WIRING BOARDS:

Concurrent with the shipment, the supplier shall furnish test samples, slugs, or coupons appropriately identified and traceable to the batch or lot number. When flexible circuits or printed wiring boards are purchased in accordance with an applicable specification, the supplier furnished coupons and data shall satisfy the requirements of the applicable revision of the Specifications and its amendments.

5.10 Delete (Moved to 5.15)

5.11 AGE CONTROLS, PERISHABLE ITEMS:

Articles delivered under this order shall contain: (1) date of manufacture (2) shelf life expiration date (3) batch or lot number. The remaining life shall not be less than 80% of the total shelf life at time of delivery. In addition, materials purchased under this requirement shall include a copy of the manufacturer's technical bulletin describing use and precautions, if applicable.

5.12 PRODUCTS, METHODS AND MANUFACTURING PROCESSES:

Supplier shall enforce controls to assure **all** design construction, components, fabrication, material, processing methods changes, facility relocation, management changes, change in sub-tier suppliers, **or** changes that may impact form-fit-function-performance-durability have not **changed since the last successful Qualification, First Article Inspection, on-site survey, SSE, and Customer notification**, have **NOT** been changed since previous or during purchases without written approval from Kaman. Supplier shall notify the Kaman buyer of any such changes. Kaman quality will make a determination if any action, such as first article inspection or on-site survey is appropriate.

5.13 SUPPLIER QUALITY SYSTEM:

The contractor's quality system shall meet or exceed the requirements of the Kaman Aerospace Corporation, Kaman Fuzing SUPPLIER QUALITY REQUIREMENTS MANUAL. The manual is located on the Kaman web site www.kamanaero.com/Fuzing/SQRM. During the performance of this purchase order, the suppliers quality system, inspection system and manufacturing processes are subject to review, verification and analysis by Kaman, Kaman customer representatives and Government representatives as applicable. **Supplier shall maintain a Quality System that is greater or equal to MIL-P-45208.**

5.14 Delete (Moved to 5.34)

5.15 FIRST ARTICLE INSPECTION TWELVE (12) MONTHS:

First article inspection and acceptance may be required on this order. First Article Inspection by definition is 100% inspection of all engineering characteristics including drawing notes on a random sample of parts from the production lot that is 100% complete to the engineering drawing and / or purchase order requirements. If the supplier has not manufactured or processed this product for a period of **twelve (12) months from the last date of manufacture**, revises the tooling, implements new tooling, implements a change in processes or is a new supplier for this product, FAI is required to be performed at the suppliers facility, unless otherwise authorized in writing. When assemblies and sub-assemblies are subject to FAI, each part and process within the assembly or sub-assembly shall have a separate FAI. Additionally an FAI shall be performed on the completed assembly or sub-assembly. Please contact your Kaman purchasing agent to arrange Kaman witnessing of the FAI Inspection. First Article Inspection shall be performed on a random sample of parts from the production lot that are 100% complete to all engineering drawing and purchase order requirements. Hardware shall not be delivered without a Source Inspection & Test Surveillance Record (QAF 06-01) signed and stamped by a Supplier Quality Engineer or a copy of a waiver (QAF 05-31) signed by an authorized Kaman Quality Representative. Suppliers located within the State of Connecticut shall provide a minimum of three (3) working days advanced notice for First Article Inspection. Suppliers located outside the State of Connecticut shall provide a minimum of ten (10) working days advance notice for First Article Inspection. Upon notification to the supplier, the Kaman customer(s) shall be allowed access to the supplier's facility to jointly witness the FAI with the Kaman representative.

5.15 A FIRST ARTICLE INSPECTION SIX (6) MONTHS:

First article inspection and acceptance may be required on this order. First Article Inspection by definition is 100% inspection of all engineering characteristics including drawing notes on a random sample of parts from the production lot that is 100% complete to the engineering drawing and / or purchase order requirements. If the supplier has not manufactured or processed this product for a period of **six (6) months from the last date of manufacture**, revises the tooling, implements new tooling, implements a change in processes or is a new supplier for this product, FAI is required to be performed at the supplier's facility, unless otherwise authorized in writing. The supplier shall submit written FAI plan(s) to Kaman for review and approval prior to executing the plan(s). When assemblies and sub-assemblies are

subject to FAI, each part and process within the assembly or sub-assembly shall have a separate FAI. Additionally an FAI shall be performed on the completed assembly or sub-assembly. Please contact your Kaman purchasing agent to arrange Kaman witnessing of the FAI. First Article Inspection shall be performed on a random sample of parts from the production lot that are 100% complete to all engineering drawing and purchase order requirements. First article inspections may be witnessed by a Kaman representative. Hardware shall not be delivered without a Source Inspection & Test Surveillance Record (QAF 06-01) signed and stamped by a Kaman Supplier Quality Engineer or a copy of a waiver (QAF 05-31) signed by an authorized Kaman Quality Representative.

Suppliers located within the States of Connecticut or Florida shall provide a minimum of three (3) working days advanced notice for First Article Inspection. Suppliers located outside the States of Connecticut or Florida shall provide a minimum of ten (10) working days advance notice for First Article Inspection.

Upon notification to the supplier, the Kaman customer(s) shall be allowed access to the supplier's facility to jointly witness the FAI with the Kaman representative.

5.16 STATIC SENSITIVE MATERIAL:

Parts on this order are static sensitive devices. Static sensitive parts shall be packaged in protective containers. Packing and marking shall comply with MIL-STD-1686 or EIA JESD625.

5.17 Delete (Moved to 5.35)

5.18 CONTROL OF SPECIAL PROCESSES:

Suppliers who perform a process such as welding, heat treating, brazing, plating, soldering, anodizing, painting, non-destructive testing, etc. shall be Kaman approved or listed on the Kaman "Qualified Process Supplier List" prior to the manufacture and/or processing of the articles defined in the purchase order. Approved sources are Program specific per requirements for performance of the special process shall be noted on the purchase order or Vendor Instruction (V.I.).

5.19 Delete (Moved to 5.36)

5.20 SOLDERING REQUIREMENTS:

The requirements of the current revision of J-STD-001, "Procedures and Requirements for Preparation and Soldering of Electrical Connections" are applicable. The supplier's quality system shall contain documented evidence of compliance to J-STD-001, CLASS 3. The supplier shall furnish a Certification of Solderability with the electronic components specified on this PO. **All personnel performing soldering per this paragraph shall be trained and certified according to IPC-J-STD-001 Class 3.**

5.21 Delete

5.22 MATERIAL SAFETY DATA SHEET:

The supplier shall furnish a Material Safety Data Sheet (MSDS) for the material specified on this Purchase Order.

5.23 Delete

5.24 Delete

5.25 EXPLOSIVE DEVICES:

Hazardous Material Identification and Material Safety Data Sheet are required on this Purchase Order. DFARS 252.223.7002 "Safety precautions for Ammunition and Explosives" and 252.223.7003 "Change in Place of Performance-Ammunition and Explosives", DOD 4145.26M "Contractor's Safety Manual for Ammunition and Explosives", FAR 52.223-3 and Notification to Suppliers of Hazardous Material - No. P124 apply to this order.

5.26 Delete

5.27 Delete

5.28 Deleted

5.29 Deleted

5.30 Deleted

5.31 SOFTWARE CONTROL:

Software Controls per the Supplier Quality Requirements Manual Appendix E apply to this purchase order.

5.32 CALIBRATION SERVICES:

Calibration services required by this order shall comply with the requirements of ANSI/NCSL-Z540-1.

5.33 CERTIFICATION OF COMPLIANCE ON FILE:

Documented evidence of conformance shall be on file for a minimum of **(10)** five years from the delivery date or as specified on the Purchase Order and available for review upon request. Para 5.33 does not relieve the supplier from furnishing certifications and data requirements by PO test or other Quality Codes.

Exception to this paragraph is JPF program. Suppliers shall retain all documentation for minimum of (20) years.

5.34 FIRST PIECE INSPECTION TWELVE (12) MONTHS

First Piece Inspection and acceptance may be required on this order. First Piece Inspection, by definition is the inspection of a given operation or process. The purpose of First Piece Inspection is to verify that process or operation will conform to engineering drawing requirements. If the supplier has not manufactured or processed this product for a period of **twelve (12) months from the last date of manufacture**, revises the tooling, implements new tooling, implements a change in processes or is a new supplier for this product, First Piece Inspection is required to be performed at the suppliers facility, prior to producing the balance of the lot, unless otherwise authorized in writing. Contact your Kaman purchasing agent to arrange Kaman witness of the First Piece Inspection. Hardware shall not be delivered without objective evidence of First Piece Inspection (Source Inspection & Test Surveillance Record QAF 06-01 signed and stamped by a Kaman Supplier Quality Engineer) or a copy of a waiver (QAF 05-31) signed by an authorized Kaman Quality Representative. Suppliers located within the State of Connecticut shall provide a minimum of three (3) working days advanced notice for First Piece Inspection. Suppliers located outside the State of Connecticut shall provide a minimum of ten

(10) working days advance notice for First Piece Inspection. Upon notification to the supplier, the Kaman Customer(s) shall be allowed access to the supplier's facility to jointly witness the FAI with the Kaman representative.

5.34 A FIRST PIECE INSPECTION SIX (6) MONTHS

First Piece Inspection and acceptance may be required on this order. First Piece Inspection, by definition is the inspection of a given operation or process. The purpose of First Piece Inspection is to verify that process or operation will conform to engineering drawing requirements. If the supplier has not manufactured or processed this product for a period of **six (6) months from the last date of manufacture**, revises the tooling, implements new tooling, implements a change in processes or is a new supplier for this product, First Piece Inspection is required to be performed at the suppliers facility, prior to producing the balance of the lot, unless otherwise authorized in writing. Contact your Kaman purchasing agent to arrange Kaman witness of the First Piece Inspection. Hardware shall not be delivered without objective evidence of First Piece Inspection (Source Inspection & Test Surveillance Record QAF 06-01 signed and stamped by a Kaman Supplier Quality Engineer) or a copy of a waiver (QAF 05-31) signed by an authorized Kaman Quality Representative. Suppliers located within the State of Connecticut shall provide a minimum of three (3) working days advanced notice for First Piece Inspection. Suppliers located outside the State of Connecticut shall provide a minimum of ten (10) working days advance notice for First Piece Inspection. Upon notification to the supplier, the Kaman Customer(s) shall be allowed access to the supplier's facility to jointly witness the FPI with the Kaman representative.

5.35 USE OF KAMAN APPROVED SUPPLIERS:

Inclusion of this quality paragraph requires that suppliers **and sub-tier suppliers** requiring subcontract services shall use subcontractors approved by Kaman for the performance of such services. The approved subcontractors are listed on [www.kamanaero.com\supplier support\supplier quality page\qualified process supplier list](http://www.kamanaero.com\supplier_support\supplier_quality_page\qualified_process_supplier_list)

5.36 X-RAY FLORESCENCE (XRF) REQUIRED:

Supplier shall provide XRF results with nickel or gold plating to show evidence of plating thickness.

5.37 SPC REQUIREMENTS:

The supplier shall implement Statistical Process Control (SPC) per the requirements of the SUPPLIER QUALITY REQUIREMENTS MANUAL APPENDIX C.

5.38 SOURCE SUBSTANTIATION OF ENGINEERING (SSE):

Source Substantiation of Engineering per the Supplier Quality Requirements Manual Appendix A, apply to this purchase order. All corrective actions requests will be processed through the Kaman Auto-Quality system and require formal, written cause and corrective action from the supplier **or Sub-tier supplier**.

5.39 CERTIFIED SUPPLIER PROGRAM:

Certified Supplier Program requirements per the Supplier Quality Requirements Manual Appendix B apply to this purchase order.

5.40 SIX SIGMA and LEAN:

Six Sigma and Lean methodologies per the Supplier Quality Requirements Manual, Appendix D apply to this purchase order.

5.41 REQUIREMENTS FOR SOLDERED/PLATED ELECTRICAL, ELECTRONIC ASSEMBLIES/HARNESSES/CABLES/COMPONENTS AND MECHANICAL ITEMS

Electronic, electrical, electromechanical, and mechanical piece parts and assemblies, including the internal fabrication of hardware, delivered to Kaman Aerospace Corporation under the provisions of this Purchase Order shall not have pure tin finishes. Any tin-lead plating or solder process/processing shall result in a finish of no less than 3% lead composition. The following surface finishes are exempt from this requirement: gold, nickel-palladium, nickel-palladium-flash-gold, tin-silver, and tin-silver-copper.

Note: This applies to "component leads and terminations(internal and external), carriers, bodies, cages, brackets, housings, mechanical items, hardware (nuts, screws, bolts), etc.

Seller shall provide a Certificate of Conformance (C of C) with each shipment.

The C of C shall mean that the Seller or Seller's agent has verified **and validated** that delivered product meets the minimum 3 % lead (Pb) composition requirements, or the material meet at least one of the following provisions:

- a. Seller or Seller's agent has contacted the Original Equipment Manufacturer (OEM) and verified that the specific Mfr / Lot Date Code of delivered product meets the specified minimum lead (Pb) requirement if Tin (Sn) is present in the product.
- b. Seller or Seller's Subcontractor has verified by actual sample testing (X-ray Fluorescence testing is preferred) or other industry acceptable method that a minimum of 3% lead (Pb) is present in any process that uses tin (Sn)..

If the material ordered under this P.O. is governed by a MIL-SPEC or Kaman Control Drawing or Specification that specifies or allows the use of tin (Sn) that contains less than 3 % lead (Pb), Seller is to contact the Kaman Buyer to have this Quality Attachment removed from the Purchase Order.

Seller shall be responsible for managing compliance with this requirement with subcontractors or sub-tier suppliers, and provide evidence of the appropriate flow-down and management of this requirement to the satisfaction of the Buyer or designate.

5.42 **Deleted duplicate see 5.33**

5.43 FOREIGN OBJECT DAMAGE / DEBRIS (FOD) PREVENTION

- (a) The supplier shall establish and maintain an effective Foreign Object Damage / Debris (FOD) prevention program to reduce FOD. The suppliers program shall be proportional to the sensitivity of the design of the products(s) to FOD, as well as, to the FOD generating potential of the manufacturing methods. The written policies and procedures developed by the supplier shall be subject to review and audit by Kaman, and disapproval when the suppliers policies and procedures do not accomplish their objectives.
- (b) The supplier shall establish and maintain an effective Foreign Object

NOTE 1: When requirement paragraph 5.43 is specified on the purchase order without suffix a or b, paragraph 5.43(a) applies.

6.0 REFERENCE DOCUMENTS

6.1 QRP 0541.07 "Supplier Quality Requirements"

6.1 SQRM "Supplier Quality Requirements Manual"

7.0 CONCURRING AREAS/APPROVALS

7.1 CONCURRING AREAS

7.2 APPROVAL

Approved via e-mail by Bill Majzlik Manager of Quality Assurance,
Kaman Precision Products Inc. Orlando, FL

Approved via e-mail by Roger Olson, Manager of Quality Assurance,
Kaman Precision Products Middletown, CT

Approved via e-mail dated by Jack Bergquist, Director Supply Chain
Management.

Signature on file.