



SUPPLIER QUALITY ASSURANCE REQUIREMENTS

(Applies to RAM's Suppliers and Sub-Tier
Suppliers, as Applicable)

REV 04/11/2018

Q010 GENERAL REQUIREMENTS CLAUSES

1.0 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. The purpose of this document is to clearly define for each purchase of products or services, all of the necessary and applicable technical and quality requirements with which the Supplier must comply to meet the requirements of RAM Company, its customers and/or regulatory authorities. For the purpose of the balance of this document RAM Company shall be referred to as "RAM" who is the Customer which has entered into a Purchase Order agreement with the Supplier.

Failure to comply with any of the requirements flowed down in the Purchase Order, drawing or the applicable clauses of this document may result in RAM, RAM's Customer or Government investigations, monetary forfeitures and payment withholds. All questions about requirements must be understood and resolved before accepting the Purchase Order.

2.0 APPLICATION.

Unless expressly excluded by the Purchase Order Q010 which includes sections 1, 2, 3 and 4 herein **applies to all Purchase Orders**. The "Q" codes listed in section 5 apply only when the specific Q-code number is included in the quality requirements section in the lower right corner of the Purchase Order.

The Supplier is responsible to flow down any and all applicable requirements to any approved sub-tier source they intend to use in the performance of this Purchase Order.

3.0 SUPPLIER RESPONSIBILITIES.

3.1 Government Rated Contracts.

Rated orders are identified in the Purchase Order by a priority rating such as DX, DO, etc. This requirement also applies if the drawing or Purchase Order notes identify it as a government contract. When a rated program applies, **United States International Traffic in Arms Regulations (ITAR)** - also apply. When the technical data provided by RAM is flagged with an "ITAR Requirements Apply" identifier the supplier agrees that all technical data provided to Supplier by RAM will be used in strict compliance with the ITAR requirements and solely for the performance of the work per the Purchase Order. The Supplier agrees to implement procedures for restricting access to the technical data to U.S. nationals only. If during the performance of the work, the Supplier is required to provide such technical data or part to a sub-tier source, the Supplier may do so provided that such sub-tier source is also located in the United States and further provided that the Supplier has imposed upon the sub-tier source the same ITAR obligation/restrictions as contained herein. Upon completion of the work hereunder, including any warranty period, the Supplier and all sub-tier source(s) involved shall return all technical data to RAM.

3.2 Anti-Terrorism Policy.

The supplier agrees to comply with the executive order 13224 – blocking property and prohibiting transactions with persons who commit or support terrorism notice of September 24, 2001 – and further agrees to include this statement in each lower-tier contract or purchase order issued hereunder.

3.3 Prohibited Practices.

The following acts and practices are prohibited, unless approved by RAM in writing. Any violation by the Supplier may result in disapproval of the Supplier for future business with RAM. In addition, the Supplier shall invoke (flow down), at a minimum, the requirements of section 1 thru 4 to all the Supplier's approved sub-tier sources performing work for the Supplier that is scheduled for delivery to RAM on the Purchase Order.

3.3.1 Verbal Instructions.

The supplier's quality management system shall be structured such that it does not allow verbal agreements or instructions as authorization or approval to proceed (e.g. on items that affect quality, fit, form or function). Any changes to purchase order agreements or drawing requirements must be requested in writing and approval communicated back in writing in the form of a modified PO change(s) in writing or a signed drawing change before acceptance.

3.3.2 Facility, Process, Method, etc. Changes.

The use of Supplier sub-tier sources must be approved by RAM before their use and the sub-tier source selected shall be Nadcap certified.

Once the first article is produced by the Supplier, the Supplier shall notify RAM in writing at least 90 days in advance of any of the following changes:

- 1) The sale, relocation, or transfer of any manufacturing operations. This includes movement of equipment and/or changes in manufacturing methods.
- 2) Any other condition deviating from the original approved manufacturing methods used for the original first article part production which could have an effect on the product potentially resulting in problems at the next assembly or function at the end item user.
- 3) Any proposed change of original third tier suppliers used to manufacture the first article product.

Since RAM may be required to notify and obtain approval from our customer for these types of changes the supplier is not authorized to proceed with the implementation of the change until written approval is obtained from RAM.

3.3.3 Unauthorized Product Repairs & Salvage.

The Supplier may not perform any repairs such as welding, brazing, soldering, plugging, peening, bushing, use of paints, adhesives or plating, or use any standard or other repair practice or method on products damaged or found to be discrepant during fabrication or processing or on defects in casting or forgings, unless such repairs are specifically permitted by the applicable drawing or specification or are specifically authorized by RAM in writing for each occurrence. Unless specifically authorized by RAM this prohibition also applies to reworking products by removing plating (stripping) and re-plating. In the case where RAM authorized product repair, salvage or stripping has been accomplished the Supplier shall include on the packing list/shipper or on the C of C that the product being delivered was subject to such RAM approved repair, salvage or stripping and the method used.

The supplier shall confirm that the drawing on file matches the revision level indicated on the PO. The supplier shall not proceed with the performance of the PO if the revision level of the drawing or any other documentation noted on the PO, for example, does not match the revision specified on the PO. The supplier shall contact RAM for resolution of any revision issues before processing.

3.3.4 Unauthorized Product Changes or Substitutions.

The Supplier shall not make any changes or substitutions to any product(s) or services required by the applicable drawing, specification or Purchase Order (PO) without prior written authorization by RAM. Authorization may be contingent on RAM or RAM's representative's review of proposed changes at the Supplier's facility.

3.3.5 Use of Non-Conventional Manufacturing Methods.

Unless specified on the drawing, specification or Purchase Order, the supplier 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 RAM without prior written authorization of RAM.

3.3.6 Glass Beads.

The use of glass beads is restricted from use during the manufacture of any products to be delivered to RAM.

3.3.7 Altering Data on Documents.

The use of any method that causes the original data on documents to be obliterated and unreadable (i.e. the use of correction fluids, correction tape, write-over, or other methods) to correct, modify or otherwise alter the data and/or entries on any certifications, test reports, or other documents required by the Purchase Order is strictly prohibited. Any necessary correction shall be made by a single line through the incorrect data and the correct data entered as close as possible to the original entry. The change shall then be initialed or stamped and dated by the person making the change.

3.4 Required Practices.

3.4.1 Responsibility for Product Conformance.

Neither audit, surveillance, inspection and/or tests made by RAM or RAM's representative at either the Supplier's or RAM's facility, nor Supplier's compliance with all applicable, product assurance requirements clauses herein, shall relieve Supplier of the responsibility to furnish product(s) that conform to all of the requirements of the Purchase Order.

3.4.2 Raw Material Requirements.

All raw materials provided on this Purchase Order and/or used to produce product manufactured per this contract **must be melted by domestic sources unless prior approval is obtained from RAM to use non-domestic melted source material**. The origin of mill source must be identified on the supplied certifications. **Refer to paragraph 3.9 and Q050** for more detailed requirements.

3.4.2.1 Counterfeit Raw Material and Electronic Parts: Avoidance, Detection, Mitigation and Disposition.

Any Supplier providing raw materials or electronic components to RAM shall have a system in place compliant to AS5553 and AS6174 to detect, and preclude delivery of any counterfeit components or materials from being delivered to RAM. The Supplier shall ensure that only new and authentic materials are used in products delivered to RAM. The Supplier may only purchase raw materials directly from original melt sources, or authorized distributors who can provide evidence of certification from the original melt source. For electrical components they shall only be procured from the original component manufacturers, (OCMs), OCM franchised distributors, or authorized aftermarket manufacturers. **No product delivered to RAM is to be procured from brokers.** Use of product that was not provided from authorized sources is not allowed unless first approved in writing by RAM. The Supplier must present compelling support documentation (e.g. certification with the product from the melt source in the case of raw materials or from the OCM in the case of electronic components that authenticates traceability of the product to the original source) as proof that the product is authentic and conforming to these requirements.

3.4.2.2 Conflict Materials.

As defined in the Dodd-Frank Act, conflict minerals include gold, tin, tantalum, and tungsten. The Act addresses concerns that conflict minerals are traded to finance groups that engage in violations of human rights. Therefore, conflict material listed above originating in the Democratic Republic of the Congo (DRC) or an adjoining country (Angola, Burundi, Central African Republic, the Republic of the Congo, Rwanda, South Sudan, Tanzania, Uganda, and Zambia) used on products to be supplied to RAM are not authorized.

You must be able to certify product containing any of the materials noted above originated from a smelter that is validated as compliant in accordance with the Conflict-Free Smelter (CFS) Program and listed on the Compliant List. The Conflict-Free Smelter Program – Is a list of certified compliant smelters in accordance with EICC criteria. The full list and additional information is available at <http://www/eicc.info/CFS Program.shtml>.

3.4.2.3 Additional Material Requirements.

Hardware, Bulk-item and Age Control Material Certifications – Cots and large quantity hardware items including nuts, bolts, washers, shims, springs, etc. that are high volume light weight shall be accompanied by a certification of conformance citing that the materials meet the specification called for on the Purchase Order. The supplier will be responsible for crediting RAM for shortage of parts exceeding 3% of the order line item(s). Overages will not be accepted for payment. The count of parts may be accomplished by weight. The scale used shall be able to accurately weigh parts repetitively and be calibrated per the requirements of paragraph 4.2.

Bulk-Items – Bulk items such as paint, potting, sealants, etc. furnished hereunder shall be accompanied by a certification of conformance citing that the materials meet the specification called for on the Purchase Order. **The certification shall meet all the requirements of and be transmitted to RAM per Q050.**

Copies of certifications, as applicable, from actual material manufacturers shall be included.

Age Sensitive Material – The material expiration, as applicable, shall be noted on the certification. A **minimum 80% shelf life** shall remain upon shipment unless waived by RAM in writing.

REACH Compliance – Suppliers must be aware of European Union (EU) REACH compliance materials. Prohibited substances as defined by REACH must be disclosed to RAM Company.

3.4.2.4 Obsolescence Requirement.

The supplier shall perform an obsolescence analysis of the product Bill of Material (BOM) for any product being delivered to RAM where they control the design. The purpose is to categorize every item in the product BOM as to 1) Known obsolescence 2) Potential obsolescence, and 3) Small or no obsolescence concern. Should this analysis apply to the product being offered to RAM the supplier shall notify RAM of the part/material that is affected and recommended replacements so RAM can get the necessary approvals from our customer.

3.5 Access to Facilities.

It is agreed, that in the execution of this Purchase Order RAM and/or its prime contractor, including FAA or Government representatives, will be permitted on site to review Suppliers facilities and procedures, as deemed necessary.

3.6 Basic Quality System Requirements.

The Supplier shall maintain a quality system compliant to the system approved by RAM. The preference is to ISO 9000, AS9100 or AS9120. However, RAM also realizes that some of our Suppliers are small and it is not economical to comply with these level of

quality systems. Therefore, RAM holds the option to require compliance to systems like MIL-I-45208 MIL-Q- 9858 or others as long as the RAM quality system and control (verification) of the quality of the product meets the flowed down requirement from our customer (compliance verified through a Supplier survey, onsite visits or both) and receiving inspection results.

3.7 Inspection and Acceptance.

The product(s) pertaining to this Purchase Order are subject to inspection, testing and approval at all reasonable times and places by RAM, RAM's Customer or Government representative before, during and after performance and delivery. RAM may require the Supplier to rework, replace or reimburse the purchase price of rejected material or RAM may accept any materials and upon discovery of nonconformance, may reject or keep and rework any such materials not so conforming. Cost of repair, rework, replacement, inspection, transportation, repackaging, and/or re-inspection by RAM **shall be at Supplier's expense.**

RAM's failure to inspect does not relieve Supplier of any responsibility to perform according to the terms of the Purchase Order. If sampling is used by the Supplier to accept parts, the sampling plan must be per Q030. **All personnel performing inspection activities shall have annual eye tests by a certified optometrist. These records shall be made available to RAM upon request. Reference the chart found in Q130 for requirements.**

Characteristics of CTQ Parts that have the greatest impact to customer satisfaction and may be identified as Flight/Mission Safety Characteristic (★), KPC1, KPC2, [0], or [2] characteristic. Any such identified features require special inspection criteria.

Special Inspection Features Identified on the Drawing by One of the Following Symbols

- (★) Flight/Mission Safety Characteristics requires 100% inspection.
- **KPC1** - These characteristics require 100% inspection.
- **KPC2** - These characteristics may be sample inspected per ASQ Z1.4, general inspection level II, .65% AQL. C=0 acceptance requirement applies.
- **Box 0** - A '0' inside a box - requires 100% inspection of this characteristic.
- **Box 2** - A '2' inside a box - These characteristics indicate sampling per ASQ Z1.4 general inspection level II, .65% AQL. C=0 acceptance requirement applies.

C=0 means if any nonconforming characteristic(s) are found in the various samples sited the lot shall be screened 100% for that characteristic(s) and the nonconforming parts shall be removed from the lot before shipping to RAM.

For those requirements requiring 100% inspection the supplier must document on the C of C that these dimensions were inspected 100% as required per the characteristic designation.

3.7.1 Supplier Workmanship Guidelines.

A large category of quality escapes is delivered from RAM's supply base. In an effort to reduce the impact of late deliveries due to received product that cannot immediately be used, RAM has developed RCS-2021 "Supplier Workmanship Guidelines". This document details RAM's expectations for a quality product. Therefore, as a supplier to RAM you are expected to refer to and share these expectations with your organization to insure the product received at RAM meets all the requirements and expectations. You can access the Supplier Workmanship Guidelines by accessing RAM's website, www.ramcompany.com, and click the Services Tab, Quality Assurance Tab and download the Supplier Workmanship Guidelines PDF.

3.8 Sub-tier Source Selection.

The Supplier shall not use sub-tier sources for the manufacture or processing of any materials or processes on product(s) scheduled for delivery to RAM unless they are a RAM Customer approved source when that requirement is specified on the Purchase Order. When not specified, a Nadcap certified source shall be used. If a Supplier proposes to use a sub-tier source not meeting either of these requirements the Supplier must get prior written authorization from RAM before use. Should the Supplier propose to use a sub-tier source which does not meet the specified requirements the Supplier shall submit to RAM within five (5) calendar days following receipt of this Purchase Order, the sub-tier company name(s) and address(s) of all the sources planned for use in accomplishment of work hereunder. Failure to use sub-tier sources approved by RAM may result in rejection of delivered items.

3.9 Certification Requirements.

The Supplier shall provide a Certificate of Conformance (C of C), on company letterhead or other identifying document, a written statement that all product and/or services being provided to RAM were (i.e. manufactured, honed, heat treated, tested, plated, etc.) and comply with all requirements of the Purchase Order, drawing or other specification(s). As a minimum, all certifications shall contain, as applicable, the material description, part

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number, revision, reference to all applicable specifications applicable to the material or process, acceptance criteria specifications, quantity delivered and RAM's Purchase Order number and line.

If you intend to deliver a few extra pieces over what is called for on the PO the actual quantity being shipped must be noted on the C of C for traceability purposes. Quantities in excess of 10 extra parts must be approved by RAM prior to including more parts than that. If approval is not received in advance these extra pieces may not be accepted by RAM.

3.10 Nonconforming Products & Material Review Authority.**3.10.1 Supplier Material Review Authority.**

The only Material Review Authority granted to the Supplier by RAM is rework to bring the product to full compliance with all requirements and scrap. No other material disposition authority is currently granted to the Supplier.

3.10.2 Notification, Segregation and Control of Nonconforming Products

Unless otherwise specified in the Purchase Order all nonconforming material shall be submitted to RAM engineering for disposition. The Supplier may use their current format to notify RAM of the nonconformance including the requirement and the dimensional or other characteristic deviation(s) from the requirement. A section shall be included which identifies the cause and corrective action to avoid a recurrence of a future deviation. A tracking number shall be applied to the request. Should RAM approve the deviation a copy of the approval signed by a RAM representative(s) shall be returned to the supplier. The Supplier shall segregate and clearly identify all nonconforming product. The identification shall include a reference to the deviation document tracking number. When delivering nonconforming material, a copy of the signed approved deviation document will be included with the shipment containing any nonconforming product. A use-as-is or repair disposition by RAM approval does not relieve the Supplier of the legal responsibility and liability for such products.

3.10.3 Notification of Nonconforming Product Delivered to RAM.

When the supplier has determined that nonconforming product(s) have been delivered to RAM the supplier shall notify RAM's buyer in writing within twenty-four (24) hours of the initial discovery. The supplier shall use receipt acknowledged e-mail or other positive notification method. The notification shall include the following at a minimum:

Supplier name
Purchase Order and release number
Part number and description
Affected quantities
Dates shipped
Brief description of the nonconforming condition

The initial notification shall be followed by a formal "Disclosure Letter" delivered to the RAM buyer within five (5) days of the initial notification. Contact RAM for a suggested format.

The Supplier shall use receipt acknowledged e-mail or other positive notification method. For purposes of this notification the Supplier Quality Assurance representative may contact RAM Quality Assurance for a recommended format to use. If the Supplier has a form that contains all the necessary information their form can be used.

At a minimum for the initial submittal of the notification the form sections dealing with Supplier name, RAM Purchase Order number including line item(s) affected, part number and description, affected quantity, dates delivered and a brief description of the nonconforming condition shall be completed.

Within five (5) working days of the initial notification a revised notification with the remaining sections populated shall be submitted. These sections shall consist of a complete description of the nonconforming condition(s), immediate action(s) by the Supplier to contain the nonconforming product(s), root cause analysis of the nonconforming condition(s), root cause corrective action(s) plan, schedule of implementation and the plan and schedule for verifying the effectiveness of the corrective action(s).

RAM reserves the right to participate in the nonconforming product investigation at the facilities of the Supplier or its sub-tier sources.

3.10.4 Re-submittal of Products Previously Rejected by RAM

Products returned to the Supplier by RAM and re-worked or replaced by the Supplier and re-submitted to RAM shall be clearly identified as re-submitted products. **The Supplier's packing list/shipper shall include a statement that the products delivered are replacement, or reworked to meet all applicable requirements and include a reference to an approved deviation document as applicable.** All re-submitted product shall be re-inspected per the requirements of paragraph 3.7 before submittal.

Objective evidence may be in the form of date, lot, serial number, revision letter, or other positive identification. Such records are subject to on-site verification by RAM at the Supplier's facilities or the facilities of the Supplier's sub-tier sources.

3.11 Document Sources**3.11.1 RAM and/or Customer Drawings**

Copies of RAM or RAM Customer proprietary documents (i.e. drawing, specification, etc.) required by the Supplier to comply with the Purchase Order requirements will be furnished to the Supplier by RAM with the Purchase Order.

These proprietary documents shall be controlled such that they are not shared or utilized by personnel or other entities not associated with the performance of the Purchase Order. Once the purchase order has been completed these proprietary documents shall be returned to RAM with the final shipment. Copies of industry, national, international or US government documents and standards are the Supplier responsibility including maintaining the current revision of each applicable document. Any problems experienced by the Supplier in obtaining the required documents shall be brought to the attention of RAM's buyer.

3.11.2 Document Revision Status

Unless otherwise specified on the Purchase Order with the statement "Use Specification and Revision Specified" for specifications that are listed that have been cancelled, superseded or the revision is not listed, the current specification and revision in effect on the date of issue of the Purchase Order shall apply. Should there be any question, the Supplier shall contact RAM for clarification prior to processing the order.

3.12 Contract Changes & Their Effectivity**3.12.1 RAM Initiated Changes**

The supplier shall incorporate, at the specified and agreed upon effectivity points, all changes initiated by RAM or their customer and communicated to the Supplier through a formal Purchase Order change and/or amendment. Such changes may be in the form of revised drawings, specifications, tests, inspection or fabrication methods, etc., and may apply to products as well as to the Supplier's management and administrative systems. The Supplier's business management system shall include appropriate controls and records, including controls at the Supplier's sub-tier sources, which provide objective evidence that changes were incorporated as required by the Purchase Order.

3.12.2 Supplier Initiated Changes

The Supplier may not make any changes in product design, drawings, performance specifications, materials or processes that will result in a Class I change (as defined by MIL-STD-973 or ISO 10007) without specific approval by RAM in writing prior to incorporating or making such changes in products or data. When applicable, the Supplier shall flow-down this requirement to the Supplier's sub-tier sources. The Supplier may make changes on products under Supplier's proprietary engineering design control that result in a Class II change (as defined by MIL-STD-973 or ISO 10007). The Supplier shall furnish a copy of the Class II change to RAM prior to the initial delivery of the (changed) product, so that RAM can verify that the change does not violate the product specification requirements.

3.12.3 Drawing Change Classes

Class I Changes – Any change in design, fabrication, methods, or processes that will result in a Class I change (as defined in AS ISO 10007) shall be submitted to RAM for our written approval prior to effecting such change.

Class II Changes – Seller may incorporate Class II changes without prior approval. Seller shall however furnish a copy of the revised product description or waiver prior to delivery of the revised product.

4.0 ADDITIONAL QUALITY REQUIREMENTS**4.1 Record Retention**

Unless otherwise specified on the Purchase Order, the Supplier shall retain all quality records as objective evidence of conformance to Purchase Order requirements, including Supplier's and their sub-tier source's records and certifications of the inspections and test(s) performed in the course of procurement. Examples of quality records include inspection records, special process records/certifications, manufacturing documentation, training records, internal audits, eye examinations, work instructions and any other quality records pertinent to the manufacture of the product supplied. These records shall be retained for a **minimum of fifteen (15) years after completion of the order**. Such records shall be maintained to insure their legibility for **two (2) reproductions (copies)** and must be retrievable within 24 hours should RAM request copies to be provided. In lieu of hard copy the records may be kept electronically as long as the electronic copy is fully legible. **Prior to physical destruction or disposal of these records**, the Supplier shall offer the records to RAM for retention at no additional cost to RAM and/or our customer(s). This requirement shall be flowed down to any sub-tier supplier approved for use by the supplier.

4.2 Supplier Calibration System

The Supplier, performing any manufacturing, inspection or test operations, shall maintain all M&TE equipment used to measure and/or test product for final acceptance calibrated by an outside lab or internally as long as the calibration is performed per ANSI/NCSL Z540.3. The Supplier shall notify RAM of any product accepted with equipment found with out-of-tolerance conditions.

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An out-of-tolerance condition is one where the uncertainty of the measurement equipment itself or the master standard(s) used to calibrate the equipment is found to exceed the limit called out in the specification cited above. The Supplier and/or sub-tier source certification(s) shall include a statement indicating the traceability number to the NIST standard used to calibrate the equipment. The supplier shall insure that any internal or outside personnel performing calibration services have current annual eye tests on file and made available to RAM upon request. **This paragraph also invokes the requirement of Q130.**

4.3 Material Handling.

The Supplier shall control product(s) during manufacturing, special processing, test or shipment in order to avoid and visually inspect for dents, scratches, discoloration, contamination, etc. which violate the surface requirements of the product(s) drawing and specifications. Refer to the Supplier Workmanship Guidelines found by accessing RAM's website, www.ramcompany.com, and click the Services Tab, Quality Assurance Tab and download the Supplier Workmanship Guidelines PDF.

Unless otherwise specified in the Purchase Order, product(s) should be shipped using best commercial practices for safe arrival at RAM's facility to and including segregation of individual piece parts with critical surfaces from contacting each other during shipment to ensure product surface integrity.

4.4 Foreign Object Damage.

Parts shall be handled during manufacture and shipping in a manner that will protect them from exposure to contamination by foreign objects or materials by using appropriate clean trays and packaging materials which will not contaminate the surfaces. This may include the use of protective caps, clean covered plastic trays rather than fiber egg crates, etc.

4.5 Rust Prevention.

In order to prevent parts from corroding (rusting) between the time they are manufactured and during storage the supplier shall coat the parts with rust preventative oil within 8 hours of manufacture. This requirement applies to materials such as C1026, C1117, C1215, Greek Ascoloy, C416, C440C, mag iron or any other material containing iron that is prone to rust when exposed to moisture or high humidity during storage periods.

4.6 Delivery Window.

The supplier shall make deliveries to RAM based on the following receipt window. All receipt of products outside this window will be scored as nonconforming and will affect the suppliers score card. RAM reserves the right to refuse early shipments and may elect to return them to the supplier at their expense.

On-Time is considered on the due date to 7 days early

Unacceptable delivery performance is considered >7 days early, late 1 or more days.

4.7 Flight Safety Hardware.

When the product being manufactured is identified as Flight Safety hardware either on the drawing or the PO the documentation used to produce the part must be frozen following the initial lot and can't be changed without notifying RAM in writing in advance of the proposed change and waiting for written approval from RAM before making the change.

4.8 Special Quality Requirements.

The special product quality assurance requirements defined by the various Q-codes below apply when the Q-code number is specified on the Purchase Order and/or referenced within sections 1 thru 4 above.

5.0 Unique Q-Codes.

The below Q-codes apply only if they are called out in the quality assurance requirements section found on the bottom right of the last page of the Purchase Order.

Q020 Adopted Additional Requirements.

Due to the complexity of some of the quality requirements flowed down to RAM by our customers, it becomes economically advisable that RAM adopt their requirements in addition to our internal requirements to form our total quality requirements. In these cases, copies of these documents will be provided as well with our Purchase Order. Examples of these documents would be MQIs, P9112, manufacturing process instructions, etc. When RAM elects to do this, it shall be understood that these requirements are to be treated as additional requirements of RAM and not the company whose documents are being provided. RAM takes full responsibility and liability associated with the flow down of these requirements.

Q030 Lot Acceptance.

For manufactured product(s), unless otherwise specified on the Purchase Order, the Supplier shall inspect each lot prior to delivery to RAM by using sampling per ANSI/ASQ Z1.4, General Inspection Level II, (normal inspection), AQL 1.5%. Should any characteristic be found to be noncompliant, the lot shall be screened 100% for that characteristic(s) and all nonconforming parts shall be removed from the lot before shipment. This applies to all characteristics other than CTQ characteristics (see paragraphs 3.7).

Q040 Source Inspection.

Items on this Purchase Order are subject to inspection and/or test at Supplier's facility by a RAM quality representative prior to shipment. The representative may be accompanied by, or the representative may actually be, a RAM customer, FAA or government source representative. The Supplier shall furnish, at no cost, acceptable facilities, equipment, personnel and assistance as necessary for such inspectors or tests.

Evidence of source inspection shall accompany Supplier's shipment, but such inspection shall not constitute final acceptance of the material. Final acceptance shall be at RAM's facility only. The Supplier shall notify RAM at least 48 hours in advance of material readiness for source inspection.

Q050 Certificate of Conformance (C of C).

Supplier shall provide a C of C meeting the requirements of paragraph 3.9.

Additional Certification Requirements – The Supplier shall furnish all certifications, issued by Supplier or Supplier's sub-tier sources. All certifications shall be legible and remain legible for two (2) reproductions (copies). A copy of all certifications must be included in the shipment. The Supplier is responsible for verifying certifications furnished by Supplier's sub-tier 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 Supplier, the certifications shall include the name of the issuing organization and shall be signed by an official of the issuing organization. Only actual signatures rendered in black (preferred) or dark blue ink by the signing official or a machine or computer graphics generated facsimile signature are acceptable to RAM. The Supplier or sub-tier source official may use a quality or inspection stamp in lieu of a signature, providing that such stamp(s) identify the Supplier and the Supplier's authorized individual to whom the stamp is assigned, and that the issue, use and control of such stamp(s) are governed by Supplier's and/or sub-tier source's documented procedures.

Q060 Supplier Furnished Raw Material.

With each delivery of product(s), the Supplier shall provide material certifications and test reports covering the material used to fill this order. All certifications shall meet the requirements of paragraph 3.9. A copy of the certifications shall be included with the shipment.

In addition, for metallic materials, each lot or heat of material supplied on this purchase order shall include, as applicable, the material name or designation, alloy, type, class, grade or condition, producer's (mill) name, the lot or heat number, the material specification and revision and the chemical / physical test report(s) to which the material complies. The certifications shall also clearly state the country of origin of melt for all raw materials being provided or used to manufacture the product being provided. In addition, the seller shall insure compliance to the counterfeit parts requirements per paragraph 3.4.2.1.

When the seller is furnishing a manufactured part using raw materials provided by the manufacturer, and subsequent NDT is to be controlled and ordered by RAM, **Q070 also applies**. If multiple heat lots are utilized, the parts shall be segregated by heat lot used and multiple segregated samples from each lot of material shall be provided and clearly marked with the lot they came from.

See the rust preventative clause in paragraph 4.5

Q070 Raw Stock Specimen Material.

In addition to actual manufactured product(s), when heat treat is a requirement the Supplier shall furnish at least three 1" long samples of raw stock from the same material used to produce the parts delivered to RAM. These samples are for use by RAM in support of NDT testing. These material samples shall be bagged and tagged with the material name or designation, the heat number, the raw material Purchase Order number and the RAM Purchase Order number which the material was utilized on.

Q080 Ram Furnished Material

Raw material to be used on this order will be furnished by RAM. When delivering the product, a certification of conformance meeting the requirements of paragraph 3.9 shall be submitted with the shipment to RAM. In addition to the required information per paragraph 3.9 the C of C shall contain a statement (or similarly): "Parts manufactured from material furnished by RAM." The disposition of any excess material will be RAM's responsibility; but it is the responsibility of the Supplier to maintain control of RAM furnished material to avoid use on any other product(s), while in their possession, in order to maintain material traceability by the Supplier and RAM. Traceability at a minimum shall include the material identification and Purchase Order that procured the material while in the possession of the Supplier and this information shall accompany the material when returning any excess material to RAM. This is the same information provided with the material when furnished.

Q090 Special Process Certifications.

Each special process to be performed on a product(s) hereunder (i.e. welding, plating, heat treatment, chemical film application, x-ray, dye penetrant, magnetic particle inspection, brazing, etc.) shall be certified by the Supplier or sub-tier source performing the process as having been performed to the applicable specification(s) called for on the Purchase Order (reference paragraph 3.11.2). **All special processes must be performed by Suppliers approved by RAM and be Nadcap certified. All certifications shall meet the requirements of paragraph 3.9.** In addition to the process certification, when certified operators are a requirement as called out in the process specification, the certification shall include a statement (or similarly) "We hereby certify that [operator's name or other identifying information like a controlled stamp, etc.] performed the [name of process] required by RAM specification, drawing number, etc., in accordance with [applicable specification]. Said operator has been trained to perform stated process and objective evidence of his/her current qualification status is on file and available for review"]".

See the rust preventative clause in paragraph 4.5

Q100 Test Data.

Actual test results showing compliance with acceptance requirements of the applicable specification and revision is required. Such data shall be identified to each item tested and show both criteria and results obtained. **The certification shall meet the requirements of paragraph 3.9.**

RAM PROVIDED SAMPLES: When RAM provides 1" long samples with the lot they are for the purpose of testing in lieu of testing the actual part(s) since such testing like hardness indentations are detrimental and unacceptable to the end use of the part. **No actual part testing which causes deformation of the part surface shall be performed without prior approval by RAM.** These samples shall be processed with the lot in order to represent the same processing as the part(s). For heat treated or annealed materials, at least one of these 1" long samples used during the process, shall be returned to RAM with the shipment for use by RAM to verify the reported hardness results. This sample shall be identified with the part number and Purchase Order number ordering the testing.

SUPPLIER PROVIDED SAMPLES: When the supplier is providing product that was manufactured with supplier provided raw material the Supplier shall provide a minimum of three 1" long samples to their approved sub-tier source when the Purchase Order is specifying that a complete part which includes special processing such as heat treat, etc. on the Purchase Order, drawing or other applicable specification is being ordered. The Supplier shall flow down to the sub-tier source(s) the requirement that no actual part testing which causes deformation of the part surface shall be performed without prior approval by RAM. The Supplier shall require the sub-tier source to return at least one of these 1" long samples to them for verification of hardness or other required test verification. This sample shall be retained by the supplier per the requirements of paragraph 4.1. In lieu of the Supplier retaining this sample they may forward it to RAM with the lot for RAM's retention. This sample must be bagged and clearly marked with RAM's Purchase Order number and line, supplier purchase order number, issued sub-tier source and material type and specification.

Q110 Raw Material Analysis

Furnished Samples – Supplier shall, at no charge, furnish a sample of material representing, and identified to, material used on this Purchase Order. This sample shall be furnished to RAM for chemical and physical analysis. Any decision by the Supplier to fabricate parts prior to analysis and material approval shall be at Supplier's risk.

Q120 Supplier Analysis.

When required by RAM's customer flow down the Supplier shall send a sample of material they intend for use on this Purchase Order to an independent testing laboratory for chemical and physical analysis at the Supplier's expense. Any decision to fabricate parts with this material prior to analysis results and approval shall be at Supplier's risk. The material analysis results must comply with the material composition and properties listed in the applicable material specification. This over check shall be performed at least once during a twelve (12) month period. The results of this analysis shall be reported to RAM.

Q130 Calibration.

Calibration of equipment shall be performed in compliance to ANSI/NCCL Z540 3. The lab performing the calibration shall notify RAM immediately of out-of-tolerance conditions. An out-of-tolerance condition is one where the uncertainty of M&TE or the master standard(s) used to calibrate the M&TE exceeds the limit called out in the above specification. Certifications shall be provided per paragraph 3.9 except instead of part number and revision, the certification shall reference the equipment identifier (ID #). The certification shall include a statement indicating the traceability number to the NIST standard used. Calibration test results compliant to Q100 shall be included.

Any personnel performing calibration of equipment shall have on file an annual eye examination performed by a certified optometrist or medically qualified personnel.

Vision Parameter	Requirement
Far Vision	Snellen Chart 20/50 or better
Near Vision	Snellen 14/18 or better (20/25 or better, Jaeger Type 1, Ortho-Rated 8 or equivalent).
Color Vision	Average or normal (4 to 6 responses on Titmus, B+L, or American Optical testing machine, or a satisfactory response when tested with an Ishihara or Pseudoisochromatic plate). Ability to distinguish red, green, blue and yellow colors as prescribed in Dvorine Charts, Ishihara Plates or equivalent. A practical test using color coded wires and/or color coded electrical parts shall be acceptable.

Q140 First Article Required.

The Supplier shall prepare a first article package per AS9102 and furnish a copy of the completed 1st Article Inspection results (including all material, process and other certifications required by the Purchase Order and/or drawing notes) with the initial delivery of products on the Purchase Order. The 1st Article shall be repeated and submitted any time any of the events specified in AS9102 occur (i.e.: there is a change to the revision of the drawing, significant changes in the manufacturing method, lapse in production of 2 years, etc.) or if the Purchase Order specifically specifies a first article is required. If specified on the Purchase Order the first article shall be submitted to RAM for review and acceptance prior to delivery of the product. The first article part shall be separately bagged and/or tagged.

Q150 Final Inspection Report (FIR).

Prior to each delivery of products to RAM the supplier shall perform final inspection on all products and document the results on a Final Inspection Report (FIR). The FIR shall represent the manufacturing lot to be shipped. The FIR format is optional however, it shall show each requirement and the actual inspection results (range) obtained for each of the drawing or specification requirements. The FIR shall be submitted with the shipment to RAM.

Q160 Silver-Coated Copper Wire Red Plague Avoidance.

Silver-coated copper conductor is susceptible to galvanic corrosion in the presence of water or humidity and oxygen. The phenomenon is also referred to a 'red plague'. This corrosion can lead to electrical or mechanical failure of the affected wire. Once corrosion is initiated, corrosion of the copper conductor can continue indefinitely in oxygen. The supplier shall take all steps necessary to prevent and detect the formation of corrosion (Red Plague) on wires per SAE ARP6400. The certifications provided with this wire shall state that the product has been verified to be free of any Red Plague corrosion per this specification.