Supplier Quality Requirements Manual

SQM-001 Rev. C

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INTRODUCTION

Our Suppliers

AeroVironment Inc. (AV) recognizes the very important role our Suppliers have in the value we offer our customers. As an extension of our own operations, we rely on our Suppliers to provide material, products, and services which meet all of the requirements of AV contracts, applicable specifications, and the quality management requirements outlined herein.

Purpose

The purpose of this manual is to inform component distributors, suppliers and contract manufacturers (hereafter refer as “all Suppliers”, unless otherwise specified) of the requirements AV has regarding suppliers’ quality management systems, design engineering and manufacturing process controls, required for the purpose of doing business with AV. This manual describes what AV expects its Suppliers to do to ensure that components, materials, sub-assemblies and systems meet AV’s requirements and expectations.

Scope

The information in this manual applies to all Suppliers providing AV with materials, products, processing, finished products and related services, and when applicable, to Supplier sub-tier sources who have an interest in, or are doing business with AV.

Requirements

In this manual, the terms "shall" and "must" mean that the described action is mandatory; "should" means that the described action is necessary and expected with some flexibility allowed in the method of compliance; and “may” means that the described action is permissible or discretionary.

Questions

Questions concerning this manual should be directed to your respective AV Supply Chain Representative. To the extent where the SQRM conflicts with AV’s standard terms and conditions the provision of AV’s terms and conditions shall prevail.

AV Supplier Quality Requirement/Compliance Matrix

Section	Requirements	Distributor	Supplier	CM
	Supplier Code of Conduct	✓	✓	✓
1	QMS	✓	✓	✓
2	Supplier Approval Process	✓	✓	✓
3.1	Compliance to Contractual Reqs	✓	✓	✓
3.2	AV Designated Sources	✓	✓	✓
3.3	Right of Entry	✓	✓	✓
3.4	UL Requirements	N/A	✓	✓
3.5	Compliance with REACH Regulations	N/A	✓	✓
3.6	Compliance with RoHs Regulations	N/A	✓	✓
3.7	Conflict Minerals	N/A	✓	✓
3.8	Control of Sub-Tier Suppliers	N/A	✓	✓
3.9	Control and Release of AV Furnished Documents	✓	✓	✓
3.1	Contractor Manufacturer Documentation Access	N/A	✓	✓
3.11	Business Continuity	✓	✓	✓
4	Part Qualification	N/A	✓	✓
5	Manufacturing Control	N/A	✓	✓
6	Change Control	N/A	✓	✓
7	Control of Non-conforming Material and Products	✓	✓	✓
8	Packaging, Labeling	✓	✓	✓
9	Record Retention	✓	✓	✓
10	Corrective Action	✓	✓	✓
11	Supplier Monitoring	✓	✓	✓
12	Supplier Performance	✓	✓	✓
13	Policy Expectations	✓	✓	✓
14	Acronyms and Abbreviations	✓	✓	✓
15	Applicable Documents	✓	✓	✓

SUPPLIER CODE OF CONDUCT

Suppliers shall ensure operations are being performed in a manner that is appropriate, as it applies to their ethical, legal, environmental, and social responsibilities.

1 QUALITY SYSTEM REQUIREMENTS

AV requires that all Suppliers maintain an effective, documented quality management system suitable to the products and services provided to AV Inc. preferably by a recognized third-party and comply with the latest revision of the following standards. In addition, the Supplier must meet all other requirements of this manual as appropriate to what they are providing as define by the Compliance Matrix on page 2.

In absence of a third party certification, depending on the product type, its application, value and criticality, AV's Supply Chain Management Team (SCMT), a cross-functional team comprised of a representative from Quality, Manufacturing Engineering, and Purchasing or Subcontracts, may provide authorization through other evidence of compliance which may include an audit by AV or a self-assessment compliant to the following standards:

- ISO 9001 – Quality Management System Requirements
- AS/EN/JISQ 9100 – Quality Management System Requirements (Aerospace)
- Calibration suppliers to meet the ANSI/NCSL Z540.1 - Calibration Laboratories and Measurement Test Equipment Requirements. In addition, for equipment used for UL product testing, they shall be accredited to A2LA (ISO/IEC17025).
- Commercial-Off-The-Shelf Suppliers (COTS) - Suppliers that provide commercial products all establish a QMS in compliance with ISO 9001-2008, or equivalent.
- Other industry recognized Aerospace and Automotive standards and best practices applicable

1.1 Quality Manual & Procedure

Upon request, the Supplier must furnish AV with a controlled copy of the Supplier's Quality Manual and supporting procedures in English. The quality management system documentation shall include Supplier's statements of a quality policy and quality objectives. The Supplier must notify AV of any substantive changes to the Supplier's Quality Management System (QMS), top-level management, and/or quality management.

All Suppliers of production materials to AV must be approved by AVSupply Chain Management Team prior to the issuance of purchase orders. All Suppliers must be approved by AV, regardless of approvals by customers or other entities.

2 SUPPLIER APPROVAL PROCESS

The Supplier Approval Process consists of the following three Approval elements:

- A Supplier Survey Questionnaire completed by the Supplier.
- A document audit of the Supplier's quality system procedures, if required.
- An on-site assessment, if required.

2.1 Initial Assessment

After AV Supply Chain determines that a Supplier potentially fits within AV supply chain needs AV:

- Will request a completed a Supplier Survey Questionnaire. A Purchasing designate will review the questionnaire with the Supplier Quality representative to determine whether to proceed with approval of the Supplier and which approval elements are required.
- AV may also request the Supplier to provide a copy of its QMS certificate and/or applicable regulatory certificates, and/or complete a self-assessment of its business and QMS and capabilities (i.e., quality, delivery, technology, cost, and continual improvement objectives).

2.2 Document Audit

If required, the AV Supplier Quality representative will review the Supplier's Quality Manual and supporting procedures to determine if the documented quality system meets AV requirements.

In those cases where a Supplier's quality management system has not been certified by an accredited certification body, AV may request additional supporting procedures (and perhaps internal audit reports) to determine if the Supplier's QMS meets AV's requirements.

2.3 Self & On-Site Assessment (If Required) & Approval

Prior to an on-site assessment, the Supplier is asked to fill out self-assessment forms. The Supplier will be given advanced notification of such assessments. Answers to the self-assessment forms will be used as a guideline during the on-site supplier audit.

Generally, when a Supplier is certified to a related standard by an accredited certification body, AV's SCMT will not conduct an on-site assessment of the Supplier's quality management system against the same criteria. However, AV and/or its customers, due to product/process complexity or criticality, may elect to conduct on-site assessments of a Supplier's product or process capabilities and findings may be issued. These assessments could include:

- **QMS audit**– if necessary, as a result of (or in conjunction with) product or process capability assessments, to determine whether the Supplier's QMS meets one or more of the applicable standards, and is functioning effectively.
- **Business assessment** - to determine whether the Supplier has the financial resources and other business resources needed to fulfill AV needs and continuity of supply.
- **Manufacturing assessment** -to determine whether the Supplier has the production capability and capacity needed to fulfill AV volume production needs
- **Continuous Improvement assessment**– to determine if the Supplier's culture, methods and skills are present to actively pursue continual improvement.
- **Technology assessment** - to determine whether the Supplier has the needed technical resources, including production and inspection equipment, facilities, engineering resources, electronic commerce capability, etc.
- **Sub-Tier Supplier Control** – to evaluate the effectiveness of the Suppliers sub-tier management processes and ensure that products or services procured from sub-tier sources and delivered to AV conform to all applicable AV requirements.

If the AV SCMT determines that the Supplier meets all applicable requirements, AV will then classify the supplier as an Approved. AV requires all Suppliers to be approved and listed on the AV Approved Supplier List (ASL) prior to the issuance of purchase orders.

3 GENERAL REQUIREMENTS

The following set of general quality requirements applies to all Suppliers.

3.1 AV Designated Sources

Where specified by contract, PO, B.O.M., or drawings/specification, the Supplier shall purchase products, materials or services from AV designated sources. However, the Supplier is responsible to ensure that items procured from such sources meet all applicable technical and quality requirements. Supplier will manage all nonconformance activities independently. Supplier must inform AV in writing on nonconformities or conflicts related to AV's drawing or BOM ,or AV directed supplier issues.

3.2 Right of Entry

Suppliers that manufacture or provide services to AV defined requirements shall be subject to audit by AV and its customers. Access must be granted to all facilities, processes, inspections and investigate records, work instructions and related record upon request. Supplier shall be notified in advance of AV's intent to audit and provide reasonable accommodation to support date(s) requested.

3.3 UL Requirements

3.3.1 UL and other certification agency IPI

Where Underwriters Laboratory or other certification is applicable and upon the certification group receiving information on the build location for that product, the Product Safety Engineer adds the manufacturer to the AV list of certified manufacturers to indicate what product they are authorized to build. After product is ready for manufacturing, the agency announces that they will perform an IPI (Initial Product Inspection). AV will schedule with the agency for IPI at the designated factory to have the agency verify product conformance to its requirements specified in the construction report. AV's safety and regulatory engineer will schedule the meeting and notify the supplier or CM of the audit schedule ahead of time. Suppliers or CM's need to make arrangements to prepare and accommodate the visit. AV safety and regulatory representative will participate in the visit.

3.3.2 Agency Follow-up Services

Where applicable and upon completion of the IPI, agencies will make an unannounced visit of the factory where the product is built, normally 4 time per year. The Follow-up Services verifies that a manufacturer of agency certified product is producing the product in accordance with the requirements of the Follow-Up Services Procedure.

3.4 Compliance with REACH Regulators

When required by AV Drawing or Specifications, Supplier products shall be free of Substances of Very High Concern (SVHC) at a concentration of >0.1% per the European Union Commission Regulation EC 1907/2006, "Registration, evaluation, authorization and restriction of chemicals." (REACH)

3.5 Compliance with RoHS Regulations

When required by AV drawing or specifications, Suppliers working with PCBA components and assembly process shall comply with EU directives 2011/65/EU, "Restriction of hazardous substances" (RoHS II Compliance)

3.6 Conflict Minerals

All parts and/or material supplied cannot contain conflict minerals originating in the Democratic Republic of the Congo or the adjoining countries of Angola, Burundi, Central African Republic, the Republic of the Congo, Rwanda, South Sudan, Tanzania, Uganda, and Zambia ("Covered Countries"). Accordingly, Supplier shall certify to the best of their ability:

a) Whether the parts and/or material supplied contain conflict minerals – tantalum, tin, tungsten or gold; and,

b) if the parts and/or material contain conflict minerals:

(i) The relevant identification number(s) of the parts and/or material that contain conflict minerals and which conflict minerals are incorporated in each item;

(ii) That the conflict minerals did not originate in a Covered Country;

(iii) The supplier from which Seller obtained the conflict minerals; and

(iv) The smelter used to produce the conflict minerals.

Supplier shall include this clause or equivalent provisions in lower tier subcontracts for the delivery of items that will be included in or furnished as materials provided as product to AV.

3.7 Control of Sub-suppliers

The Supplier is responsible for the quality of materials and components provided by their sub-tier Suppliers and subcontractors. (This does not include AV provided material.) AV Suppliers must have a process in place to ensure their sub-tier Suppliers comply with all AV applicable specification and standard requirements. This process shall:

- Provide (flow-down) applicable specification and standard requirements to sub-tier suppliers
- Provide (flow-up) of any changes/variances for AV approval prior to making any changes
- Ensure physical and/or functional inspection has been performed by the sub-tier suppliers
- Request and manage First Article Inspection from sub-tier suppliers
- On demand, provide objective evidence to AV personnel of compliance.

Where appropriate, AV may

- Specify the sub-tier Suppliers that may be used.
- Audit and certifies the sub-tier Supplier's facilities.

- Assists the Supplier in controlling the sub-tier Supplier.

AV involvement does not eliminate the Suppliers' full responsibility of its sub-tier Suppliers' and sub-contractor's quality performance.

3.8 Contract Manufacturer Documentation Access

Upon acceptance of AV PO, Contractor Manufacturer's agree to provide to AV information and reports, in a format and on a frequency requested by AV including but not limited to full set of AV developed process related documentation such as electronic copy of Floor Layout, Work Instructions, Yield Reports, FMEA, and Control Plans, etc.

3.9 Business Continuity

The Supplier should have a business continuity plan which would allow for the safeguarding, storage and recovery of engineering drawings, electronic media, and production tooling in the event of damage or loss. This plan should also contain contingency plans to satisfy AV requirements in the event of significant utility interruptions, labor shortages, and equipment failure and field returns.

4 PART QUALIFICATION

This section defines the generic requirements for production part qualification and approval. The purpose is to determine if all AV design and specification requirements are properly understood by the Supplier and that the manufacturing processes have the capability to consistently meet these requirements.

In all instances where a product is manufactured to a new design, for a new system, or for a new application, it is important that Supplier and AV allocate responsibility for assuring that all performance, endurance, maintenance, safety and warning requirements are met. It is preferred that this allocation of responsibility be in writing.

4.1 First Article Inspection

Supplier shall refer to the Aerospace First Article Inspection Requirement (AS9102 Latest Revision).

A FAI is required to initially qualify a part/process for Supplier approval. The FAI requires that all features and characteristics defined in as AV specified requirements be inspected and verified prior to production. Actual measured values shall be recorded as opposed to general statements of conformance or other notations simply indicating acceptance.

FAI submission is required with any of the following changes:

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

In addition to an FAI, Suppliers as applicable shall develop a Control Plan by identifying special product and process characteristics that are key to achieving quality. The Supplier shall also include those special characteristics designated by AV in the drawing, specification, or contract.

The inspection process includes the Supplier:

a) Inspecting or testing each sample for ALL dimensions, drawing notes, material requirements, and specification requirements listed on the current revision of the AV drawing.

b) Recording the results on the FAI.

c) Numbering or Ballooning a copy of the AV drawing and specification to correspond with the Supplier's results.

4.2 Production Part Approval Process (PPAP)

As required by AV, the Supplier shall submit a more comprehensive Production Part Approval Process (PPAP) qualification package. The Supplier is responsible for obtaining the latest

revision of the applicable AIAG core tool reference manuals and forms. The AIAG Core Tools Manuals are:

- Advanced Product Quality Planning (APQP)
- Production Part Approval Process (PPAP)
- Potential Failure Mode and Effects Analysis (FMEA)
- Control Plan (CP)
- Measurement Systems Analysis (MSA)
- Statistical Process Control (SPC)

When a PPAP is specified by the AV, the Supplier shall submit a **"Level 3" PPAP** package to AV which consists of the following items, unless otherwise directed. **See AIAG PPAP Manual, Table 4.2, for complete list of submission requirements for each level of PPAP.**

4.3 Pilot Fabrication

Pilot Fabrication is a Supplier produced production run of material for material qualification. The required quantity shall be specified in the Purchase Order. The material must be produced under volume-production conditions, including material, machines, tooling, processing parameters, cycle times, etc.

Any exceptions to the volume-production conditions must be recorded in the data package submitted to AV in writing and approved by AV Supplier Quality Engineering. The Supplier must coordinate the timing of the Pilot Fabrication to ensure Supplier Quality Manager (or designee) and other AV representatives are present during the production run if required. AV must validate and verify the process before any product is shipped.

4.4 Sub-Supplier Certifications & Tests

For material and other specified requirements for which the Supplier does not have the equipment to test, the Supplier must obtain material certifications (or test reports) from their sub-Supplier(s) or other test agency.

The material certification reports must include the following information:

- Specification/Drawing number.
- Specified material/dimensional/physical requirements.
- Inspection/test results.
- Signature of the organization that performed the testing.

The reports must be traceable to the Supplier's material through lot/heat/coil/ batch numbers or the like. A simple statement that the material meets the requirements is not acceptable.

The supplier shall plan, implement, and control processes, appropriate to the product, for the prevention of counterfeit or suspect counterfeit materials to be used in product(s) delivered to AV.

4.5 Safety Data Sheets (SDS)

As required, the Supplier must furnish Safety Data Sheets (SDSs) for all materials shipped to AV.

5 MANUFACTURING CONTROL

5.1 Lot Control

A lot consists of product of one part number and revision that are made at the same time, under the same processing conditions, from the same lot of raw materials. The primary purpose for identifying lots is to determine the scope of actions that must be taken when problems arise during further manufacturing or with customers.

As required, each container of material shipped to AV must be identified with the Supplier's lot number. Inspection records must be traceable to lot numbers.

The following are typical conditions that may affect lot numbers:

- Change of part number or revision.
- Change of part number or revision of components.
- Change to a different supplier.
- Interruption of continuous production (typically for more than a few hours).
- Repairs or modification to the tooling or equipment.
- Tooling changes (other than minor adjustment, or replacement of consumable tooling).
- Change to a different lot of raw materials.
- Change in shift.

5.2 Shelf-Life-Control

With each delivery of materials or products that have a limited or specified shelf life, the Supplier shall furnish data that shows

a) Cure or manufacture date,

b) Expiration date or shelf life,

c) Lot or batch number, and when applicable any special handling or storage requirements.

Unless otherwise specified by contract, for all shelf life limited materials or products delivered to AV, the remaining shelf life shall be a minimum of 75% of the total shelf life for the material.

5.3 Traceability

Traceability ties finished product back to the components used in the product. Traceability markings should be effective down to the individual component (i.e., lot code, batch, or serial should be identifiable at a customer rework station). AV will create and issue product specific traceability documents to suppliers when required.

5.4 Workmanship

When workmanship standards are not referenced on AV drawings or specifications, the Supplier is expected to follow industry-accepted standards for the materials and assemblies being provided. When in doubt, refer to the Supplier Quality Manager (or designee) for clarification.

5.5 (FOD) Foreign Object Damage / Foreign Object Debris Prevention

FOD is any damage attributed to a foreign object that can be expressed in physical or economic terms which may or may not degrade the product's required safety and/or performance characteristics.

Supplier shall have provisions for the removal and prevention of FOD per AS9100 requirements. Suppliers shall maintain a FOD prevention program appropriate to their company and their product using National Aerospace Standard NAS 412 as a guideline.

5.6 Preventive Maintenance

Suppliers must maintain all facilities, manufacturing machines, tools, measuring devices, and other equipment in such a manner that the Supplier can support AV production requirements, and the quality of material, parts, or assemblies manufactured for AV are not degraded in any way. Preventive maintenance of equipment should be in line with manufacturers' instructions and recommendations. All process equipment preventive maintenance schedules need to be documented and records kept.

All of the above maintenance requirements apply equally to any and all AV-supplied equipment and tooling. This customer-supplied equipment and tooling has an expected life that AV will identify. The Supplier is required to notify AV if any supplied equipment or tooling is expected to exceed its usable life within the following 12 months.

6 CHANGE CONTROL

6.1 Change Control Process

The Supplier shall have a process to ensure that relevant versions of applicable documents furnished by AV (as well as those specified of external origin) are available at points of use. The Supplier is responsible for the timely review, distribution and implementation of all AV engineering standards/specifications and changes in accordance with the schedule required.

The Supplier shall maintain a record of the date on which each change is implemented in production, the item number, revision, and serial/lot control number (when specified). Implementation shall include updated documents.

6.2 Supplier Process Change Requests

Supplier must request changes to a released part, process, drawing, or specification by submitting QSF-224 to their respective Supply Chain contact . AV encourages that before a change request is submitted to the Supplier Quality representative, the Supplier thoroughly reviews their FMEA and Control Plan to ensure that all process-related issues have been addressed and resolved.

The originator of a Supplier Process Change Request (SPCR) provides the following information:

- Drawing or part number and revision.
- Drawing or part title.
- Description of problem or recommended change.
- Reason for change or “rationale”.
- Backup documentation or data supporting the change.
- Proposed effective date.
- Signature of originator.

The SPCR approval process is as follows:

a) Supplier submits the Supplier-initiated SPCR with the revised FMEA (if applicable) and Control Plan to the responsible AV Supplier Quality representative for evaluation of the following:

- Supplier-demonstrated process capability and stability.
- Comparison to First Article data.
- Industry standards.
- Supplier process engineering capabilities.
- Supplier’s adherence to Supplier Control Plans.

b) After the AV Supplier Quality representative has completed the review, and concurs with the Supplier, the AV Supplier Quality representative documents the request as appropriate at AV (Engineering Change, First Article, etc.).

c) Request is processed as required at AV for approval.

d) Supplier Quality representative notifies the Supplier as to the final disposition of the SPCR and part submittal requirements and dates.

e) Supplier to keep track of traceability for any changes.

6.3 Supplier Request for Deviation

A Supplier shall not ship product that deviates from the print, specification limits, or design intent without prior written authorization from the AV Supplier Quality representative.

If directed by the AV Supplier Quality representative, the Supplier must send samples of all nonconforming/to AV, Inc. for evaluation. The cost of any testing required in determining the acceptability of the product may be charged to the Supplier.

6.3.1 Deviation Acceptance

Representatives from the applicable AV organizations will determine the item's acceptability and what actions (if any) are required beyond the deviation. The responsible AV Supplier Quality representative will communicate this to the Supplier. AV approval of a deviation is specific to the products for which it has been submitted and approved and is not to be construed as a permanent engineering change.

6.3.2 Containment

In all cases, the Supplier must fully contain all product suspected of being nonconforming at the Supplier location and must begin work immediately to correct the condition. Failure to comply with the mutually-agreed upon closure date for the deviation, may result in the Supplier's rating being affected. Suspect Product must be traceable to the component level and possibly raw material level depending on the deviation.

In addition, nonconforming product may be returned to the Supplier at Supplier expense, or the Supplier may be required to sort any suspect product already shipped to AV sites or be charged back for the cost of sorting by AV. Any parts shipped to AV that have been approved for deviation shall be clearly identified as such externally on the box, container, or other packaging and on shipping documentation. Inside of each box shall contain a copy of the AV-approved deviation document.

7 CONTROL OF NONCONFORMING MATERIAL AND PRODUCTS

Nonconforming material may not be sent to any AV facility or customer without a written deviation. For nonconforming products supplied to AV, including those that reach an AV customer, the Supplier must cover all costs to correct the nonconformance.

7.1 Inspection and Acceptance

(a) AV and its customer may inspect all Work at reasonable times and places, including, when practicable, during manufacture and before shipment. Supplier shall provide all information, facilities, and assistance necessary for safe and convenient inspection without additional charge.

(b) No such inspection shall relieve Supplier of its obligations to furnish and warrant all Work in accordance with the requirements of this Contract.

(c) AV's final inspection and acceptance shall be at destination.

(d) If Supplier delivers non-conforming Work, AV may, in addition to any other remedies available at law or at equity:

i. reject such Work; or

ii. require Supplier, at Supplier's cost, to make all repairs, modifications, or replacements at the direction of AV necessary to enable such Work to comply in all respects with Subcontract requirements.

iii. accept all or part of such Work at an equitable price reduction following the lead of AV's Purchasing Representative.

(e) Supplier shall not re-tender rejected work without disclosing the corrective action taken.

7.2 Notification of Escape (NoE)

Supplier shall refer to AS 9131 Standard and notify AV with NoE if any of following conditions applies:

a) Any product released by an internal or external supplier or sub-tier supplier that is subsequently determined to be nonconforming to contract and/or product specification requirements. Any undetected defect in a released product.

7.3 Control of Reworked Product

Rework is defined as additional operations that are not part of the basic production process flow, which will bring product in full compliance with applicable drawings and specifications. Instructions for rework, including re-inspection requirements, shall be accessible to and utilized by the Suppliers appropriate personnel. All rework shall be documented and accepted by quality. For reference, repair is defined as using alternative manufacturing techniques, methods, materials, or processes.

8 PACKAGING, LABELING

Unless specified on the drawing, the Supplier must adequately plan for packaging designed to prevent product contamination, deterioration or loss and to eliminate shipping damage. Suppliers should provide expendable packaging or returnable containers, where appropriate, that provide for sufficient density and protection from any likely damage that may occur. Expendable materials and packaging must meet local and national standards for safe disposal and/or recycling.

AV encourages Supplier-initiated packaging improvements that have been validated by industry standard shipping tests (i.e., drop, vibration, crush). AV reserves the right to approve all packaging materials prior to their implementation.

a) Unless otherwise specified, all Work is to be packed in accordance with good commercial practice.

b) A complete packing list shall be enclosed with all shipments. Supplier shall mark containers or packages with necessary lifting, loading, and shipping information, including the AV PO number, item number, dates of shipment, and the names and addresses of consignor and consignee. Bills of lading shall include the AV Subcontract number.

c) Unless otherwise stated, part identification shall be done per its drawing note.

8.1 Shipping Containers & Pallets

When palletizing a shipment, pallets must at a minimum be two-way hardwood stringer pallets with bottom deck boards. Due to sizing, an exception may be requested, but that must be in writing and is subject to approval by AV. One full layer of cartons on a pallet is sufficient volume to require that parts be palletized. Particularly sensitive, heavy or expensive shipments may require crating. Crating is subject to approval by AV. Pallet overhang is not allowed.

8.1.1 Securing Pallets

All shipping containers must be secured to pallets. AV requests pallets be strapped by at least two bands lengthwise or two bands widthwise and by stretch or shrink wrap where applicable. Metal, polyester or nylon strapping is recommended. The weight of the load shall dictate the strapping material to use.

8.1.2 Container Contents

Whenever possible, only one part number, and one lot will be contained on a pallet. Exceptions shall be subject to approval by AV.

8.2 International Shipment requirements

Special requirements for international shipments exist. Please follow the requirements for country of origin and destination. Any special requirements will be forwarded by AV Supply Chain representative when Purchase Orders are placed. In case of doubt, contact your AV Supply Chain representative.

8.3 8.3 Labeling

8.3.1 Required Information:

Reference QSP-8.2.4-1

8.3.2 Bar Code Requirements:

Reference QSP-8.2.4-1

9 RECORD RETENTION

The Supplier shall retain quality records for a time period specified by its quality system or related reference documents. Upon request, the Supplier shall be capable of retrieving and delivering required records to AV within forty-eight hours from time of request by AV.

Unless otherwise specified by AV or regulation, the Supplier shall maintain all records that provide objective evidence of compliance for **a minimum of seven (7) years** after the last delivery of products and/or services on the contract include, but are not limited to, financial, proposal, procurement, specifications, production, inspection, test, quality, shipping and export, and certification records. At no additional cost, SELLER shall timely provide access to such records to the U.S. Government and/or AV upon request.

Prior to discarding, transferring to another organization, or destruction of such records, the Supplier shall notify AV in writing and give AV the opportunity to gain possession of the records. These requirements are applicable to records generated by Supplier's sub-tier sources.

10 CORRECTIVE ACTION

AV requires Suppliers to use a documented closed-loop corrective action system whenever an out-of-control condition is encountered in their manufacturing facility, or after the product has been shipped to AV.

10.1 Problem Solving Process

Suppliers should use a closed-loop corrective action process (preferably 8D reporting format) whenever a problem is encountered internally or upon notification from AV. For example:

Table 1. Problem Solving Process

1	Describe the Problem	State what the problem "Is," and "Is Not" with respect to what, where, when, who, how, and how many. Use quantitative terms.
2	Use a Team Approach	Consult and coordinate with relevant stakeholders.
3	Apply Containment	Immediately contain any suspect product to protect AV and its customers.
4	Root Cause Analysis	Identify potential causes, analyze causes for failure mode, validate root cause(s), and identify solutions.
5	Implement Permanent Corrective Action	Implement solution. Update applicable FMEA, control plan and work instructions.
6	Verify Effectiveness of Corrective Action	Use check sheets, auditing, sampling, and/or control plans to monitor process performance for effectiveness and sustained improvement.
7	Implement Preventive Action	Implement changes to prevent the same type of error from occurring in similar products/processes. Update applicable documents.
8	Management Support	Review, approve, and support. Provide resources and team recognition.

For additional guidance on problem solving methods, tools, training, and related references, refer to AIAG document CQI-10.

10.2 Supplier Corrective Action Request

10.2.1 When Issued:

The AV Supplier Quality Manager (or Quality designee) issues a Supplier Corrective Action Request (SCAR) via e-mail to the Supplier when nonconforming material, parts, or assemblies are found at any of the following:

- Receiving Inspection
- In production
- In test
- In audit
- By an AV customer.

10.2.2 Required Response:

Within 48 hours from initial notification, the Supplier is required to respond by e-mailing the SCAR back to the Supplier Quality representative with the following:

- Initial Observation, the Containment, the Supplier "Root Cause" Investigation, and the Corrective Actions fields completed.
- Dates and the Supplier contact.

The Supplier is required to respond as defined in the table below.

Table 2. Performance Action Response

The Supplier shall promptly acknowledge receipt of notification and communicate to AV the immediate containment actions to be taken.	Within 24 hours
The Containment Plan must clearly define the containment actions at the Supplier's facility, to assure that no nonconforming product is shipped to AV. The Supplier must: • Address all suspect stock in transit, and any stock at any AV, Inc. facilities. • Specify what actions are to be taken. • Must bound the problem by identifying all suspect lot numbers and associated quantities involved. • Supplier must cover all sorting and additional transportation costs (sort on site or return to Supplier. Supplier must submit the CAR back to the AV Supplier Quality representative reporting the Supplier's initial observation and defining the interim containment plan.11.	Within 24 hours For Major CAR, within 3 business days from initial notification date For Minor CAR, within 5 business days from initial notification
Supplier must report the results of the Supplier's investigation into the cause of the problem.	Within 7 business days from initial notification date
Supplier must submit the Permanent Corrective Action to be taken to prevent recurrence of the problem, and the effective date (the date the Corrective Action will be implemented.). • Train (or discipline) the operator; increase inspection, and the like are not acceptable corrective actions.	Within 14 business days from the initial notification date
Supplier must keep AV informed of progress towards implementing the Corrective Action.	Ongoing
Supplier and AV Supplier Quality representative verify that the Corrective Action is effective in correcting the problem. The AV Supplier Quality representative then closes out the SCAR.	When the Corrective Action implementation is complete.

11 SUPPLIER MONITORING

AV continually monitors its Suppliers to ensure they continues to meet AV requirements and ships acceptable material, parts, or assemblies. Monitoring may consist of:

- A QMS surveillance audit at the Supplier's facility.
- An audit of the Supplier's Control Plan.
- A normal Material Quality Verification of a lot.
- Source Inspection of product at the Supplier's facility.
- Review of Supplier-furnished Data Packages.

11.1 Supplier Audits

The Supplier must make their facility available for on-site process verification by the AV Supplier Quality Manager (or designee) at any time without notice. The Supplier Quality representative conducting the verification may be supported by the representatives from other AV organizations (i.e., Quality, Purchasing, Engineering, and Manufacturing).

11.2 Quality System Audit

Periodically, AV may audit the Supplier's QMS. This may be a full or abbreviated documentation and on-site audit. The purpose of this audit is to evaluate any changes that may have occurred in the Supplier's QMS and to assess the Supplier's continuing commitment to quality improvement.

11.3 Control Plan Audit

Periodically, AV may audit the Supplier's continuing conformance to the Supplier's Control Plan.

11.4 QA & Production Inventory Control

AV expects its Suppliers to furnish material that conforms to all requirements. AV uses a C=0 Sampling Plan that rejects the lot when a single nonconforming part is found in the sample.

11.5 Source Inspection at the Supplier's Facility

AV or an AV Designated Source Inspector may inspect product on AV behalf at the Supplier's facility to detect potential problems prior to shipment to AV. AV may also inspect product at the Supplier's sub-Suppliers.

11.6 Supplier-Furnished Lot Documentation

Each Lot shipment must have a Certificate of Conformance (CoC), inspection reports, test data reports, process performance, material certification or other quality data with each shipment to ensure that the product meets AV requirements.

When data submission is required, the data must be submitted to the AV Receiving Inspection department (or other specified location) at the same time the lot is shipped. All documentation must be clearly identified with the AV part number, and the Supplier's lot number.

11.7 Data Packages

When specified , the Supplier must submit monthly data packages to the Supplier Quality representative. Data packages typically consist of copies of 1st pass yield data, Pareto charts, control charts and Cpk & Ppk calculations for specified characteristics, or test results (ORT – Ongoing Reliability Testing). Other data may be requested by the Supplier Quality representative. Data must be submitted within 15 days of the end of the reporting period.

11.8 Discontinuation of Data Submission

Data submission from the Supplier can be discontinued based on previous data submissions showing that the Supplier consistently satisfies AV requirements for process stability and process performance.

12 SUPPLIER PERFORMANCE

AV uses a number of factors, such as Quality and Delivery data to develop an Overall Supplier Performance Rating. This rating serves as an objective measure to determine whether AV expectations are being met:

- Preferred: 90%-100%
- Qualified: 75%-89%
- Conditional: < 74%

AV expects suppliers to deliver product 100 percent on-time and with zero defects.

12.1 Performance Measures

Table 3. Performance Measures

Overall Supplier Performance Scoring Elements and Their Weights			
Quality Rating Elements	**65%**	Parts per Million (PPM)	Source, Incoming, Floor failures
		Lot Accepted Rate	Incoming
		Quantity Supplier Corrective Action Requests (SCAR)	Quantity Supplier Corrective Action Requests (SCAR)
		Field Returns (FR)	Field Return
Delivery Rating Elements	**35%**	On-time delivery to Contract Date	Delivery Data

13 POLICY EXPECTATIONS

13.1 Environmental Policy

All AV suppliers should have an environmental policy compliant to ISO 14001 requirements. AV suppliers must achieve awareness and compliance with all relevant laws and local codes. AV seeks to do business with suppliers who observe the principles of sustainable development in the design, production, use and end-of life disposal of their supplied products and services. AV will reduce or discontinue business with suppliers who do not endeavor to support AV Environmental Policy (ISO14001).

13.2 Controlled Unclassified Information (CUI)

All data/information including CUI is to be managed and controlled to ensure compliance within Executive Order 13556.

14 ACRONYMS & ABBREVIATIONS

The following terms, acronyms, abbreviations, symbols, and trademarks are used within this document.

Terminology

Control Plan	A detailed description of the Supplier's proposed processing steps required to produce the part, and the controls that are put into place to control the quality at each step.
Lot	Product of one part number and revision that are made at the same time, under the same processing conditions, from the same lot of raw materials.
Pilot Fabrication	A Supplier-produced production run of material used for material qualification.
Process Capability	A comparison of the inherent variability of a process output to specification limits under statistically stable conditions.
Process Performance	The comparison of the actual process variation to the specification limits.

Acronyms & Abbreviations

B.O.M.	Bill of Material
C.A.R.	Corrective Action Report
Cpk	Process Capability Index
LSL	Lower specification limit
SDS	Safety Data Sheets
ORT	Ongoing Reliability Testing
OSHA	Occupational Safety and Health Administration
PFMEA	Process Failure Mode and Effects Analysis
PIC	Production Inventory Control
Ppk	Process Performance Index
QA	Quality Assurance
R&R	Repeatability & Reproducibility
SPC	Statistical process control
SPCR	Supplier Process Change Request
USL	Upper specification limit

Symbols

™	Trademark ownership claimed
Cpk	Process capability
Ppk	Process performance

Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Where those designations appear in this document, and AV was aware of a trademark claim, the designations have been printed in caps or initial caps.

15 APPLICABLE DOCUMENTS

Applicable Documents	UAS
Supplier Initial Survey	QSF-012
Supplier Self-assessment & Site assessment / Maturity Path Premier Suppliers-Self Assessment	QSF-225
First Article Inspection or First Article Report	AS9102 Form
Part identification and serialization/Label specification	QSP-8.2.4-1
Supplier Process Change & Deviation Request	QSF-224
C=0 Sampling Plan	ANSI / ASQ Z1.4-2008

Process Owner: Quality Assurance
Process Participants: Quality Assurance and Purchasing

END OF MANUAL

AeroVironment™

Supplier Process Change & Deviation Request

Deviation No: _____ Date: _____

To be completed by Aerovironment

This form is to communicate any change at the Supplier Level which can effect product conformance to drawing or specifcation requirements. It is the responsibility of the Supplier to ensure that notification and approval is confirmed prior to implementation or shipment of product.

Supplier to Complete	
Supplier Information	**AV Information -**
Name:	Part Name:
Street:	Part Number Affected:
City, State: Zip:	Program (If known):
Supplier Part Number Affected:	AV Requested: ☐ Yes ☐ No *check applicable*

PART 1: Supplier Change Request - *check applicable buttons*

Type of Change	
☐ Design ☐ Composition ☐ Process ☐ Sub-Supplier Change	Description: Effect of Change:

Piece Price Impact		Tooling or Facility Changes	
Will the piece price be affected by this change?	☐ Yes ☐ No	Are changes to current tooling and/or facilities needed?	☐ Yes ☐ No
If Yes, what is the cost affect?		If Yes, what is the cost affect?	

Other Concerns		Interchangeability Affected?	
Will incorporation of this change affect shipping schedules?	☐ Yes ☐ No	Will assembly interchangeability be affected by this change?	☐ Yes ☐ No
Time to complete change once approved?		Will component interchangeability be affected by this change?	☐ Yes ☐ No

PART 2: Supplier Deviation Request

Deviation Start Date:		Deviation Expiration Date:	Deviation Quantity:
Deviation Cause:			
Deviation Corrective Action:			

Supplier Authorization

Name: _____ Title: _____ Signature: _____ Date: _____

DO NOT WRITE BELOW THIS LINE - FOR SENSATA INTERNAL USE ONLY

Aerovironment Response to Supplier Request:

depending upon the supplier request responsibilities noted below are to review and take action, as appropriate to the request.

☐ Approved	☐ Rejected	By Design Engineering	_____	Date: _____
☐ Approved	☐ Rejected	By Purchasing	_____	Date: _____
☐ Approved	☐ Rejected	By Supplier Quality	_____	Date: _____
☐ Approved	☐ Rejected	By Customer Quality Engineer	_____	Date: _____

AV
5 Why Analysis Record

Problem Statement	
Date Initiated:	Initiated By:
Reference:	Assigned To:
Date Due:	Team:
CM Effectivity:	Resources:

Containment

5 Why Root Cause Analysis
1st Why:
2nd Why:
3rd Why:
4th Why:
5th Why:

Root Cause

Corrective Action

Implementation		
Action Item	**Assigned To**	**Due Date**
1.		
2.		
3.		