SSI MANUFACTURING TECHNOLOGIES CORP

Supplier Quality Manual

Revision C

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INTRODUCTION

Our Suppliers

SSI recognizes the very important role and contribution 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 that meet all of the requirements of SSI contracts, applicable specifications, and the quality management requirements outlined herein. Each supplier has a significant contribution to the conformity, quality, and on-time delivery of our work.

Ethical Behavior

Doing the right thing when nobody is looking embodies the SSI spirit of ethical behavior. SSI expects ethical behavior of all its employees and its suppliers. Ethics includes being truthful and accurate in all communication and records, integrity, complying with laws and regulations, zero tolerance for bribes or kickbacks, zero tolerance for discrimination or harassment, and doing what is right.

Purpose

The purpose of this manual is to inform SSI Suppliers of the core expectations we have regarding the Suppliers' quality management systems, design requirements, and manufacturing process controls required for the purpose of doing business with SSI. This manual describes what SSI expects its Suppliers to do to ensure that all SSI requirements and expectations are met.

Scope

This manual applies to all Suppliers providing SSI with materials, products, processing, and related services and when applicable, to Supplier sub-tier sources. The general requirements outlined herein do not supersede conflicting requirements in the SSI contract, or drawing, including applicable engineering specifications and process specifications, or applicable long-term agreement(s).

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 SSI Buyer.

1 • QUALITY SYSTEM REQUIREMENTS

Suppliers shall maintain a Quality Management System (QMS) suitable to the products and services provided to SSI, that is certified by an accredited third-party certification body to the latest version of one or more of the following, as applicable:

ISO 9001 - Quality Management System Requirements
AS9100 - Quality Management System Requirements (Aerospace)
In the absence of third-party certification, depending on the product, its application, value, and criticality, the SSI Buyer and Quality representative may authorize the acceptance of other evidence of compliance. This may include second-party (SSI) audit or first-party (self) assessment to the applicable criteria above, or to a set of alternative basic quality requirements.

Raw Material Distributors – All materials to be DFARS and RoHS compliant. Materials must be certified per purchase order requirements.
Calibration Suppliers - shall establish and maintain a measurement management system that is in compliance with either: ANSI/NCSL Z540.1/Z540.3 - Calibration Laboratories and Measuring & Test Equipment Requirements, or ANS/ISO/IEC 17025:2005 Requirements for Measurement Processes and Measuring Equipment.
Special Process Suppliers – as required by purchase order suppliers shall establish and maintain a QMS that is in compliance with AS9100, AS9003 or PRI/Nadcap AC7004.

1.1 QUALITY MANUAL

Upon request, the Supplier shall furnish SSI with a copy of the Supplier's Quality Management System Manual, which is to be current and approved by the Supplier's management, including or making reference to related documents. The quality management system documentation shall include Supplier's statements of a quality policy and quality objectives. Top management shall define quality objectives and measurements that should address customer expectations and be achievable within a defined period of time. The Supplier shall promptly notify the SSI Buyer of any substantive changes to the Supplier's quality management system or personnel.

2 • SUPPLIER APPROVAL PROCESS

SSI requires all Suppliers to be approved prior to the issuance of contracts. All Suppliers must be approved by SSI, regardless of approvals by customers or other entities.

2.1 SUPPLIER ASSESSMENT

The Supplier Approval Process may include the following:

a) Supplier Initial Assessment
SSI may request the Supplier to provide a copy of its quality management system certificate and/or complete a self-assessment of its business and quality management system and capabilities (i.e., quality, delivery, technology, cost, and continual improvement objectives).

b) Documentation Audit
In those cases where a Supplier's quality management system has not been certified by an accredited certification body, SSI may request a copy of the Supplier's Quality Manual and supporting procedures (and perhaps internal audit reports) to determine if the Supplier's quality management system meets SSI requirements.

c) On-Site Assessment
Generally, when a Supplier is certified to a related standard by an accredited certification body, SSI will not conduct an on-site assessment of the Supplier's quality management system against the same criteria. However, SSI 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. As a result, findings may be issued. These assessments could include: Quality Management System (QMS) - if necessary, as a result of (or in conjunction with) product or process capability assessments, to determine whether the Supplier's quality management system meets one or more of the applicable standards, and is functioning effectively. Business and Manufacturing Operations - to determine whether the Supplier has the financial resources, production capacity, and other business resources needed to fulfill SSI volume production needs and continuity of supply. Continual Improvement Initiative - 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, SSI-specified computer-aided design language/format, 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 SSI conform to all applicable SSI requirements.

3 • GENERAL REQUIREMENTS

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

3.1 COMPLIANCE TO CONTRACTUAL REQUIREMENTS

Upon accepting a SSI contract, the Supplier is responsible for compliance to all contract (e.g., engineering drawing, specification, purchase order) requirements. All documents, drawings and specifications, regardless of origin, are applicable to the Supplier when specified in the contract or documents referenced in the contract, and are required to be used at all levels of the supply chain. Unless otherwise specified in the contract, the document revision in effect on the date of issue of the contract applies to the contract. Neither audit, surveillance, inspection or tests made by SSI,

representatives of SSI or its customer(s), at Supplier's facilities, at any sub-tier facilities, or upon receipt at SSI, relieves the Supplier of the responsibility to furnish acceptable products or services that conform to all contract requirements; nor does it preclude subsequent rejection by SSI or its customers.

3.2 SSI DESIGNATED SOURCES

Where specified by contract the Supplier shall purchase products, materials, or services from SSI-designated sources. However, the Supplier is responsible to ensure that items procured from such sources meet all applicable technical and quality requirements.

3.3 CONTROL OF SUB-TIER SUPPLIERS

The Supplier, as the recipient of the contract, is responsible for meeting all requirements, including work performed by the Supplier's sub-tier Suppliers (also known as Sub-Suppliers or subcontract Suppliers). When the Supplier uses sub-tier sources to perform work on products and/or services scheduled for delivery to SSI, the Supplier shall include (flow-down) on contracts, to its sub-tier sources, all of the applicable technical and quality requirements contained in the SSI contract, including quality system requirements, regulatory requirements, the use of SSI designated sources, and the requirement to document and control 'key characteristics' and/or 'key processes,' and to furnish certifications and test reports as required. SSI and its customers reserve the right- of-entry to sub-tier facilities, subject to proprietary considerations.

3.4 CONTROL AND RELEASE OF SSI FURNISHED DOCUMENTS

Documents furnished by SSI to the Supplier are furnished solely for the purpose of doing business with SSI. Proprietary documents may be furnished to the Supplier in hard copy, electronic or other media. The Supplier is responsible for controlling and maintaining such documents to preclude improper use, loss, damage, alteration and/or deterioration. Unless authorized by the SSI Buyer in writing, the Supplier may not transmit or furnish any SSI furnished documents, or copies of such documents, to anyone outside the Supplier's business organization except to a sub-tier source used by the Supplier for performance of work on the SSI contract. The Supplier shall return to SSI, or purge electronic copies of, all proprietary documents with the last delivery of products or services on the contract. SSI may request the Supplier to furnish objective evidence or certification that proprietary documents have been purged. The Supplier shall flow down this requirement to all sub-tier sources, when such sources will be in receipt of SSI proprietary documents during performance of work for the Supplier.

3.5 E-BUSINESS REQUIREMENTS

SSI currently uses and is continually expanding the use of electronic business tools to facilitate day-to-day activities using electronic linkages between SSI internal operations as well as with SSI Suppliers and customers. Contracts, delivery schedules, notification of product rejections, requests for corrective action, etc. may be transmitted to Suppliers electronically, and SSI expects that Suppliers will adopt these tools to reduce errors and improve efficiency.

3.6 ELECTRONIC DOCUMENTS

The accuracy and authenticity of electronic documents and forms submitted to SSI is of highest importance. The following rules apply and may be subject to review by SSI at Suppliers facilities:

- The issue of electronic documents and application of electronic signatures must be under the direct control of the individual whose name appears on the electronic document.
- The electronic signatures may only be applied at the place where the individual is located and the individual must have direct access and responsibility for the products or services described in the electronic document.
- The application of the electronic signature certifies that the signature (individual) represents an authorized company official.
- For SSI, the use of electronic forms and signatures must be described in and governed by Supplier's documented procedures.

3.7 BUSINESS CONTINUITY

The Supplier should have a business continuity plan that 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 SSI requirements in the event of significant utility interruptions, labor shortages, equipment failure and field returns.

4 • PRODUCT QUALIFICATION

This section defines the generic requirements for production part qualification and approval. The purpose is to determine if all SSI 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 SSI 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

As required, a First Article Inspection (FAI) is required to initially qualify a part/process for Supplier approval. Furthermore, a new FAI may be requested if there is an extended gap of time (24 months) since last production. The FAI requires that all features and characteristics on the design specification and control plan 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. A quality plan will be supplied.

5 • PROCESS CONTROL

This section defines the basic necessities for Suppliers to control their manufacturing processes.

5.1 SPECIAL CHARACTERISTICS

The Supplier shall demonstrate conformity to those special characteristics designated by SSI through means of documentation and appropriate control methods. In addition to any special characteristics identified by SSI, the Supplier shall also review, identify, document, and control other product and process characteristics that are key to achieving quality.

5.2 ERROR-PROOFING

The Supplier should use error-proofing devices and techniques as a form of process control, especially for repetitive functions, difficult tasks prone to mistakes, or where the cost of error is high.

5.3 WORK INSTRUCTIONS

The Supplier shall prepare documented work instructions, as necessary, for all employees having responsibilities for the operation of processes that impact product quality. These instructions shall be maintained current and accessible for use at the workstation.

5.4 CONTROL OF MONITORING AND MEASURING DEVICES

The Supplier shall determine the monitoring and measurement to be undertaken and the monitoring and measuring devices needed to provide evidence of conformity of product to determined requirements.

As a minimum, where necessary to ensure valid results, measuring equipment shall:

a) be calibrated or verified at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no such standards exist, the basis used for calibration or verification shall be recorded; and
b) be identified to enable the calibration status to be determined.

For SSI, unless otherwise specified by contract, the Supplier shall establish procedures to control Measuring and Test Equipment (M&TE) that are in compliance with the requirements of ANSI/NCSL Z540-1 or ISO 10012.

5.5 STATISTICAL PROCESS CONTROL

Where specified in the Control Plan, the Supplier is required to apply effective statistical process controls. Suppliers should consult the Statistical Process Control (SPC) manual published by AIAG for guidance, methods, examples, and related reference information.

5.6 PREVENTIVE MAINTENANCE

The Supplier should identify key process equipment and provide resources for machine/equipment maintenance activities and develop an effective planned total preventive maintenance system.

5.7 SOURCE INSPECTION

Supplier's products or services may be subject to source inspection by SSI, representatives of SSI or applicable government or regulatory agencies. Source inspection requirement will be included on the contract and may apply to any and all operations performed by the Supplier or the Supplier's sub-tier sources, including prior to delivery of products to SSI. The Supplier shall provide the necessary access, equipment and resources required to effectively accomplish the source inspection.

5.8 SHELF-LIFE CONTROL

Materials - With each delivery of materials or products that have a limited or specified shelf life, the Supplier shall furnish data that shows (a) the 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 SSI, the remaining shelf life shall be a minimum of 75% of the total shelf life for the material.

5.9 RAW MATERIAL LOT CONTROL

In those cases where the Supplier elects to use more than one lot of raw material, the Supplier shall ensure, document and furnish positive traceability of each individual product to the raw material certification/test report that represents the raw material from which each of the products was manufactured. Traceability shall be provided by identifying the raw material heat, lot, batch or melt number from the certification/test report on the product and/or on packaging (when used), or the products segregated and identified.

6 • CHANGE CONTROL

The Supplier is responsible for controlling changes and notifying the SSI Buyer of all changes to the approved part design, manufacturing process, or site.

6.1 CHANGE CONTROL PROCESS

The Supplier shall have a process to ensure that relevant versions of applicable documents furnished by SSI (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 SSI engineering

standards/specifications and changes in accordance with the schedule required by SSI. Timely review should be as soon as possible, and shall not exceed two working weeks. The Supplier shall maintain a record of the date on which each change is implemented in production. Implementation shall include updated documents.

6.2 SUPPLIER CHANGE REQUESTS

Suppliers shall not make changes to their processes, location, facilities, equipment, material, and product design (or any change which may affect product design or function) without written approval from the SSI Buyer for - Correction of a discrepancy on a previously submitted part; Product modified by an engineering change to design records, specifications, or materials; or any planned changes by the Supplier to the design, process, or manufacturing location, such as:

a) Use of other material than was used in previously approved part or product
b) Production from new, additional, replacement or modified tools, dies, molds, patterns, etc.
c) Production following upgrade or rearrangement of existing tooling or equipment
d) Production from tooling and equipment transferred to a different plant site or from an additional plant
e) Change of sub-tier Supplier for parts, nonequivalent materials, or services (e.g. heat treating, plating, etc.)
f) Product produced after tooling has been inactive for production for 12 months or more
g) Change to test/inspection method - new technique (no effect on acceptance criteria)
h) For bulk materials: new source of raw material from new or existing Supplier, or change in product appearance attributes, etc.
i) Use of any non-conventional manufacturing methods such as electro-discharge machining (EDM), electro-chemical machining (ECM), laser or abrasive water jet metal cutting, flame spray coatings, etc.

Before submitting to SSI a request for a permanent change to a Supplier-controlled design, the Supplier shall review the FMEA and Control Plan, as applicable, to ensure that all process-related issues have been addressed and resolved.

7 • CONTROL OF NONCONFORMING MATERIAL

For nonconforming products supplied to SSI, including those that reach a SSI customer, the Supplier must cover all costs to correct the nonconformance.

7.1 SUPPLIER REQUEST FOR NONCONFORMANCE DEVIATION

A Supplier shall not knowingly ship product that deviates from the drawing, specification limits, or design intent without prior written authorization from the SSI Buyer. If such a condition exists, the Supplier may petition the SSI Buyer, in writing, to allow shipment of the product under a written nonconformance deviation.

If requested by the SSI Buyer, the Supplier must send samples of such nonconforming items to SSI for evaluation. The cost of shipping, inspection, and testing to determine the potential acceptability of such product will be charged to the Supplier.

SSI approval of a deviation is specific to the products for which it has been submitted and approved and shall not be construed as a permanent engineering change. The Supplier must begin work immediately on corrective action. In all cases, the Supplier shall fully contain all product suspected of being nonconforming. 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 SSI sites or be charged back for the cost of sorting by SSI. Any parts shipped to SSI 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 SSI-approved deviation document.

7.2 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. On the other hand, repair is defined as using alternative manufacturing techniques, methods, materials, or processes which may not bring product into full compliance with applicable drawings and specifications. Repairs are not allowed without written approval from SSI.

7.3 SUPPLIER CONTAINMENT

For product quality problems reported by SSI to the Supplier, until formal corrective action has been taken and approved, the Supplier shall provide documented evidence with subsequent shipments that such product has been inspected for the identified nonconformance and meets all applicable requirements.

7.4 COUNTERFEIT PARTS

SSI expects our suppliers to develop, implement, and maintain methods and processes appropriate to their products and services to minimize the risk of introducing counterfeit parts and materials into the supply chain. Effective processes should be in place to detect counterfeit parts and materials, and mark parts obsolete as appropriate.

8 • PACKAGING, LABELING, DELIVERY & RECORD RETENTION

Preservation, packaging, labeling, and shipping methods must comply with common industry practices and SSI requirements specified on the contract.

8.1 PRESERVATION

In order to detect deterioration, the condition of product in stock should be assessed at appropriate planned intervals. The Supplier should use an inventory management system to optimize inventory turns over time and should assure stock rotation, such as "first-in-first-out" (FIFO).

8.2 PACKAGING

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.

8.3 LABELING

The SSI Buyer will provide the Supplier with the necessary specifications.

8.4 DELIVERY

The Supplier should systematically inform SSI of any delay in delivering product and provide a new dispatch date. The Supplier is responsible for additional transport costs due to delays.

Certificates of Conformance (C of C)
A signed C of C by the Suppliers head of quality or company officer (or their authorized delegate) attesting that all products and/or services delivered are in compliance with all contract requirements shall be furnished with each shipment to SSI, All C of C's must be in the English language and may be in electronic format with electronic signatures. All signatures or signature blocks must clearly show title of the signatory. The C of C shall include:

a) Supplier Name
b) part number
c) drawing/specification revision
d) SSI contract number
e) line/release number (when applicable)
f) quantity delivered
g) packing list/shipper number (when applicable)

When additional certifications/test reports are required for special processing, raw material, etc. the requirements will be specified on the contract.

8.5 RECORD RETENTION

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

Unless otherwise specified by SSI, the Supplier shall maintain all records that provide objective evidence of compliance to SSI contract requirements for a minimum of seven (7) years, or per SSI's customer requirements, after the last delivery of products and/or services on the contract. Prior to discarding, transferring to another organization, or destruction of such records, the supplier shall notify the SSI Buyer in writing and give SSI the opportunity to gain possession of the records. These requirements are applicable to records generated by Supplier's sub-tier sources.

9 • CONTINUAL IMPROVEMENT

Suppliers should define a process for continual improvement. Recommend ISO 9004, including Annex B. A copy of the Supplier's continual improvement program shall be furnished to SSI upon request

9.1 PROBLEM SOLVING PROCESS

Suppliers should use a closed-loop corrective action process whenever a problem is encountered internally or upon notification from SSI. For example:

a) Describe the Problem, state what the problem "Is," and "Is Not" with respect to what, where, when, who, how, and how many.
b) Use quantitative terms
c) Use a Team Approach, consult and coordinate with relevant stakeholders.
d) Apply Containment, immediately contain any suspect product to protect SSI and its customers.
e) Root Cause Analysis, identify potential causes, analyze causes for failure mode, validate root cause(s), and identify solutions.
f) Implement Permanent Solution.
g) Update applicable FMEA, control plan and work Corrective Action instructions.
h) Verify Effectiveness; Use check sheets, auditing, sampling, and/or control plans to monitor Corrective Action process performance for effectiveness and sustained improvement.
i) Implement Preventive; Implement changes to prevent the same type of error from occurring in similar products/processes. Update applicable documents.
j) Management Support; Review, approve, and support. Provide resources and team recognition.

9.2 CORRECTIVE ACTION REPORT

SSI may issue a request for a Corrective Action Report (CAR) to the Supplier when nonconforming material, components, or assemblies are found.

When documenting the root cause, the Supplier shall include the underlying reasons:

a) why the specific nonconforming condition or incident occurred,
b) why it was not detected by the Suppliers quality controls, and
c) why the related process, from a systemic viewpoint, allowed the nonconformance (and potentially others like it) to occur.

The Supplier should apply the following criteria to determine whether the underlying root cause has been identified:

1. It initiates and causes the event you are seeking to explain.
2. It is directly controllable.
3. The elimination of that root cause will result in the elimination or reduction of the problem.

Statements from the Supplier indicating that the corrective action is to alert or retrain the operator, and/or increase inspection, alone, are NOT acceptable corrective actions. These kinds of actions would be considered insufficient and not address the real underlying root cause(s) of why the Supplier's policy, instructions, process, procedure, and/or system allowed the problem to develop and occur and not be detected by quality controls. Unless otherwise requested by SSI when notified, the Supplier shall respond to a request for corrective action as follows:

a) The Supplier shall promptly acknowledge receipt of notification and communicate to SSI the immediate containment actions to be taken.
b) The Supplier shall provide an update of the containment plan to protect SSI during the interim period. This update must include: Confirmation that the Supplier has identified all suspect product in process, in stock, in transit, and potentially at any SSI site by lot number, SSI contract number, and quantity. Additional specific containment actions needed to be taken by the Supplier and/or SSI.
c) The Supplier must submit the completed Corrective Action Report indicating the permanent actions taken, or to be taken, to prevent recurrence of the same problem, to prevent the occurrence of similar problems, and the applicable effectivity dates.

10 • SUPPLIER PERFORMANCE

SSI's evaluation of suppliers uses a number of factors, but is primarily focused on quality and on time delivery. At SSI's discretion, the SSI Buyer may determine to address the Suppliers performance deficiencies. A meeting with Supplier's management and/or a documented corrective action may be required. Failure to respond to corrective action requests, excessive CARs, late deliveries or quality problems can result in reassessment of approved supplier status.