



Purchase Order Quality Assurance Requirements

Purpose

This document establishes and flows down quality assurance requirements to items ordered under the purchase order of which this form is a part, to assure that such items are of the required quality and reliability.

Definitions

1. The term "Order" means the purchase Order, subcontract or other written agreement with the Seller (supplier) in which this form is incorporated by reference.
2. The term "Buyer" means Solara Engineering.
3. The term "Seller" means the legal entity which is the contracting party with the Buyer with respect to the Order.

Quality Assurance Requirements (QAR)

1. **Quality Systems** – The Seller shall provide, document and maintain a quality system that complies, as a minimum requirement, with the specification designated below. The Seller's system shall be subject to audit by the Buyer's Quality Representative.
 - A. MIL-I-45208A or Equivalent or
 - B. ISO 9001:2000 or
 - C. AS 9100 or
 - D. BQMS D682479 or
 - E. NADCAPIn addition, any Seller purveying material, hardware, components, etc shall maintain an Identification and Verification Program to provide traceability of product while under its control.
2. **Approved Sources** – All material furnished or processing performed by a sub-tier supplier under the Order must be a source approved by Buyer or Buyer's customer. Seller shall flow down to sub-tier supplier(s) the applicable requirements of the Order.
3. **Approved Materials** – Seller must furnish documentation with each shipment showing manufacturer's and supplier's traceability documentation. All material supplied under the Order shall be in accordance with the latest specification revision.
4. **Certification / Records** – The Buyer may refuse to accept items delivered under the Order if the Seller fails to submit the certification, documentation, test data or reports specified in the Order. Documentation includes source inspection record when such source inspection is performed.
 - A. **Certificate of Conformance** – With each shipment of items covered by the Order, Seller shall submit a certificate of conformance, signed by a responsible representative, which shall constitute a representation by the Seller that:
 - i. **Fabrication** - Materials used are those which have been specified by the Buyer, and that the items delivered were produced from materials for which the Seller has on file, reports of chemical and/or physical analysis, and any other required evidence of conformance of such items to applicable specification. Processes used in the fabrication of items delivered were in compliance with applicable specifications forming a part of the Order. By making shipment under the Order, the Seller automatically certifies that materials used in the items shipped (except material furnished by Buyer) and the processes applied to such articles comply with the applicable drawings and specifications. Seller agrees to retain objective evidence and/or records to substantiate significant activities in the manufacturing, inspection, testing, treat preservation, packaging, and packing of delivered items (as applicable). Such records will be made available upon request
 - ii. **Processing** – Processes utilized in the performance of the Order were performed in accordance with, and the results conforms to, all of the requirements of the Order.
 - iii. **Hardware** - The items delivered comply with all specifications and requirements of the Order.
 - B. **Material Certification** - Certificates received by Buyer must be of reproducible quality. Seller shall submit the original Certified Material Test Report (CMTR) from the test lab. The CMTR shall provide mill identity, mill tests, heat / lot number and analyses of material. Seller shall provide the original Certified Chemical and/or Physical Test Report(s) from the test lab, per applicable specifications. The report shall reflect the mill source of material.

- C. Seller shall submit certification that includes cure or manufacturing date for material whose acceptability is limited by age. Both the cure date and the shelf life shall be listed on the container and on the document certifying the material. Buyer will not accept material that has less than 75% of its shelf life remaining upon receipt. Seller shall provide certification as to country of origin of the materials, hardware, component, etc. and material safety data sheet(s) as applicable.
 - D. Safety - Unless otherwise authorized in writing, Seller shall certify that all articles furnished against the Order do not contain, nor have they been contaminated with metallic mercury or mercury compounds; nor do they include any mercury-containing devices employing only a single boundary of containment. Any applicable material safety data sheets must accompany the shipment.
 - E. Restriction of Hazardous Substances – Unless otherwise authorized in writing, Seller shall certify that all articles furnished against the Order do not contain, nor have they been contaminated with the bromated fire retardants identified as pentabromodiphenyl ether, octabromodiphenyl ether or decabromodiphenyl ether; nor do they include any bromated fire retardant devices unless that device is less than 0.1% by mass. Any applicable material safety data sheets must accompany the shipment.
5. **Identification –**
- A. All material supplied under the order must be identified with as applicable: (1) Heat / Lot Number; (2) Specification; (3) Grade; (4) Slab Number; (5) Billet Number; (6) Alloy and Temper; (7) Mill marking including material type
 - B. Each part shall be marked with a serial number; certifications accompanying part shall reflect the applicable (same) serial numbers. Marking methods shall be as follows: (1) Rubber stamp/ink; (2) Electrochemical etch; (3) Steel stamp; (4) Steel tag with wire attachment; (5) Paper tag; (6) Seller's standard method; (7) Vibropeen per drawing requirements. If inspection report(s) are required, serial numbers shall be noted on the corresponding inspection report(s).
 - C. Parts may be identified on package or container.
6. **Inspection Requirements –** The Buyer may impose the following requirements as specified by the Contract:
- A. Tooling First Article Inspection – Acceptance of production tooling on the Order shall be contingent upon inspection and acceptance by Buyer. The tooling and dimensional samples produced by said tooling must conform to the tolerance limits of engineering drawings and specifications stated on the Order.
 - B. First Article Inspection – First Article(s) are subject to inspection and acceptance by Buyer prior to a production shipment unless specifically authorized by Buyer. First article(s) shall be tagged or otherwise identified to show the tool used. A First Article Inspection Report must accompany the first article piece to document conformance to specified requirements.
 - C. Sampling Inspection – Sampling plan per ANSI 1.4 AQL4.0 Level 2 is acceptable without prior written permission from Buyer. Once in place, records shall be kept on the sampling result. Buyer maintains right of access to actual sampling records with reasonable notice.
 - D. Statistical Process Control - When requested, Statistical Control Plan to provide (1) process variance reduction; (2) process limits (statistical control limits); (3) special and common cause identification; and (4) cpk maintain at 1.3 or greater
 - E. Flowchart - The Seller shall submit a product flowchart, which defines the operational sequence, initial acceptance and testing points, and process control points, with sufficient description to identify the system. The factory inspection and test plan must be submitted prior to fabrication on the Order, and is subject to approval by Buyer.
 - F. Quality Inspection Plan – The Seller shall submit a Quality Inspection Plan which provides a complete list of drawing features and characteristics, as well as a description of how those items are to be verified; e.g., Caliper, O.D. Micrometer, Visual Reference Std., Coordinate Measuring Machine, etc (Characteristic Accountability). The Seller must approve the Quality Inspection Plan prior to shipment of items. Accordingly, it should be submitted within thirty (30) days after receipt of Order or two (2) weeks prior to completion of items, whichever is earlier.
 - G. Process Instruction – Seller shall submit to Buyer process instructions and any subsequent changes that provide a detailed step-by-step description of how to do each process performed by the Seller or his sub-tier supplier. Each process instruction shall be assigned a unique control number and shall contain the following subsections: Scope, Materials, Equipment, Safety, Instructions, Certification and/or Qualification of Personnel (if applicable) and Quality Assurance. Seller process instructions and any changes shall be validated. Buyer shall determine if validation will be by documentation review or by demonstration. Validation by demonstration consists of reviewing and implementing instruction against the Process Specification and witnessing the actual processing of a production-like piece of hardware to the applicable implementing instruction. Process validation shall be performed by Buyer's representative and when applicable, Buyer's Customer representative. The Seller shall notify Buyer of the time and place for validation. Advance notification shall be sufficient time to allow for planning.
 - F. Work Instructions – Seller shall inform Buyer of all manufacturing process and procedures used to produce parts. Once these practices are established and approved, they shall not be changed without informing Buyer. Upon notification by Buyer that approval of Seller's processing documentation is granted, Seller shall

consider all documents frozen. Any change to Seller's processing and/or documentation must be submitted to Buyer and approved prior to incorporation. A change is defined as "any change including personnel, equipment, material, tooling, etc."

7. **Surveys, Surveillance, Audits, and Inspection –**
- A. Right of Entry - Buyer has the right to conduct surveys, audits and surveillance of Seller's facility, or those of Seller's subcontractors or suppliers with prior coordination with Seller, to determine the capability to comply, and to verify continuing compliance, with the requirements of the Order. The Government has the right to inspect any or all of the work included in the Order, at Seller's facilities or at sub-tier facilities. The Seller's quality or inspection system and manufacturing processes are subject to review, verification and analysts by authorized Government Representatives. Buyer reserves the right to inspect all items upon receipt.
 - B. The Order is subject to Buyer's Source Inspection. Buyer must be notified forty-eight (48) hours in advance of the time the articles or processes are ready for inspection or test.
 - C. Buyer and Buyer's customers shall be afforded the right to verify at the Seller's facilities or at sub-tier supplier facilities that product conforms to the specified requirements. Such verification shall not be used by the Seller as evidence of effective control of quality by the subcontractor. Verification by the Buyer or Buyer's customer shall not absolve the Seller of the responsibility to provide acceptable product, nor shall it preclude subsequent rejection by the Buyer.
 - D. Government inspection is required prior to shipment from Seller's facility. Upon receipt of the Order the Seller will promptly notify and furnish a copy to the Government representative normally servicing the Seller's facility so that a Government inspection can be appropriately planned. If a Government representative does not service the Seller's facility, the Seller will contact the appropriate Government Inspection office servicing the Seller's area. If the Seller cannot locate the Government Inspection office, the Seller shall contact Buyer immediately.
8. **Conformance - Responsibility For Conformance -** Neither surveillance, inspection and/or test made by the Buyer or Buyer's representatives at either the Seller's or the Buyer's facility, nor the Seller's compliance with all applicable requirements shall relieve the Seller of the responsibility to furnish items which conform to the requirements of the Order. Nonconformance - Seller shall provide for control, segregation, and identification of nonconforming product detected at the Seller's facility. Decisions to accept nonconformances (variance from the Buyer's drawings and specifications) detected at the Seller's facilities, must be made by the Buyer unless otherwise specified in the Order. Buyer must authorize in writing prior to shipment of nonconforming material.
9. **Material –** Seller shall comply with the requirements hereunder as/if specified:
- A. Domestic Material – Material must originate from a domestic mill. Material must be accompanied with original mill certification and show origin of melting and or origin of manufacturing from ingot to purchased material condition. Any variance from this provision requires Buyer's written authorization.
 - B. Grain Direction – Grain direction will run the length of the part unless otherwise specified.
 - C. Heat Lot – Material supplied must originate from the same heat lot.
 - D. Cut Tolerances – Cut tolerances will be a minimum of +.0625/-.0000 and will not exceed +.1250/-.0000 unless agreed to in writing by Buyer.
 - E. Ultrasonic Testing – Material must pass ultrasonic testing to applicable specification.
 - F. Seller Supplied Material (Fabrication Suppliers) – Seller supplied material must conform to QAR 9A, 9B and 9C. Seller must provide copies of the following documentation for traceability: material purchase order, material shipper and material certifications. Legible copies may be supplied provided that the originals are kept on file for a period of not less than ten (10) years after expiration of contract. Seller agrees to surrender original documentation to Buyer upon closure of business, purging of files or other possible destruction of documentation.
10. **Special Processes -**
- A. Heat Treat – Seller shall submit a Certification of Heat Treatment, including the following items, as/if specified: (1) Time/temperature chart for material (entire cycle); (2) Time/temperature chart for furnace; (3) Sketch of thermocouple placement(s) with key to multi-point recording, if utilized; (4) A load thermocouple shall be used for all heat treatments. A minimum of one part per furnaces load shall have the load thermocouple attached to the thickest portion. The time at temperature shall be based upon this thermocouple.
 - B. Welding – Seller shall submit a Welding Certification(s) per applicable specification(s) including the following items as/if specified: (1) Procedure Qualification records; (2) Performance Qualification records; (3) Determination of ferrite content in deposited (Magna-Gage). Welding on material to facilitate a forming process is expressly prohibited without prior approval of Buyer.
 - C. Nondestructive Test – Seller shall submit NDT items as specified as follows: (1) Radiographic Certification; (2) Magnetic Particle Certification; (3) Penetrant Inspection Certification; (4) Ultrasonic Inspection Certification; (5) Pressure Test Certification; (6) Leak Test Certification; (7) NDT Personnel Qualifications; (8) X-Ray Film; (9) X-Ray Technique Sheets.
 - D. Forming – Seller shall submit a certification of Forming Process to applicable specification requirements. Welding on material to facilitate a forming process is expressly prohibited without prior approval of Buyer.
 - E. Plating – Seller shall submit a Certification of Plating per applicable specification

- F. Peening – Seller shall submit a Certification of Peening process per applicable specification.
 - G. Special Process(es) – Seller shall submit a certification of the Special Process as follows, per applicable specification(s): (1) Surface finish (roughness); (2) Coatings; (3) Treatments; (4) Adhesive Bonding; (5) Plastic/Composite fabrication.
 - H. Electrical Test Data – Seller shall submit Certified Electrical Test Date with shipment.
11. **Supplemental Testing -**
- A. Seller shall submit, along with shipment and certifications, test samples, as specified, representative of the processed part(s) for the following: (1) Plating; (2) Peening (Almen Strips); (3) Nonconventional machining.
 - B. Seller shall obtain a Product Analysis from an Independent Testing Lab; certified results of that analysis shall be submitted along with shipment and other certifications: (1) Chemical; (2) Physical
 - C. Seller shall subject representative sample(s) of material to impact testing. Specimens must be of the same heat or lot of material and in the same condition as production item(s). Tests and reporting shall be in accordance with the requirements on the face of the Order. Supplier shall submit Certified Impact test results along with shipment, and other certifications as/if applicable.
12. **Preservation and Packaging** – The following requirements are as applicable:
- A. All material intended for the Buyer shall be protected against usual hazards of corrosion, contamination, deformation, or other spoilage at the Seller's facility and in transit.
 - B. All material intended for the Buyer shall be packed with suitable protection to prevent damage through handling, during storage at the Seller's facility, and in transit.
 - C. All electrostatic sensitive material shall be protectively packaged to avoid damage due to electrostatic discharge.
 - D. Sheet stock shall be protected by appropriate material interleaved between individual sheets and on top and bottom surfaces of material.
 - E. Seller shall individually wrap or box items to prevent damage in transit.
 - F. Seller shall package items for shipment so as to prevent metal-to-metal contact of machined surfaces.
 - G. Protective devices accompany materials or items when shipped to Seller; Seller shall maintain protection during processing and return all such items with return shipment.
13. **Record Retention** – Seller shall maintain records for a minimum of ten (10) years from the end of the contract. Required records are defined as all manufacturing, inspection and test documentation (e.g., traveler, first article inspection report, chemical and physical test reports for material, processing certifications, test reports, etc.) performed on items delivered to the Buyer. These records shall identify conformance and nonconformance, where applicable. These records shall be made available for Buyer review.
14. **Measuring and Test Equipment** - Supplier shall establish and maintain documented procedures to control, calibrate, and maintain, inspection measuring and test equipment used by the Seller to demonstrate the conformance of product to the specified requirements. This system shall meet the requirements of ANSI-Z540, ISO 10012-1, ISO Guide 25 or equivalent, as a minimum. Supplier of calibration services shall perform calibration of M&TE in accordance with ANSI-Z540-1 and/or ISO 10012-1 and ANSI-Z540-1 as applicable. Certificates of Calibration must clearly state that the service was performed with equipment traceable to the National Institute of Standards and Technology.
15. **Age Control** - The Seller shall have an effective system of age control for items whose acceptability is limited by the age of the item. The system must include a method of identifying the age of such items and provisions for the rotation of stock.
- A. Seller shall show on each container of materials having a limited of specified shelf life (both Seller's in-plant containers and containers in which material is delivered to Buyer) the cure or manufacture date, expiration date, lot or batch number, and special storage and handling conditions applicable to the contents. This information shall be in addition to the normal identification requirements of name, part or code number, type, size, quantity, etc. Special handling conditions shall be recorded on certifications and shipping documents covering the material as delivered to the Buyer, in addition to normal identification information.
 - B. Time lapse between cure or manufacturing date and date of schedule receipt to the Buyer under the Order shall not exceed 1/4 of the shelf life of the material without prior written waiver of Buyer as to each shipment.
16. **Prohibited Practices**
- A. Unauthorized Repairs: Seller may not repair by any method (i.e., splicing, welding, brazing, soldering, adhesives, or any other means) parts supplied to the Buyer that have been found to be faulty during fabrication unless authorized, in advance, by the Buyer in writing.
 - B. Change in Approved Processes, Materials or Procedures: Seller shall not change any Buyer specified process, material or procedure without prior Buyer approval. As to any product which has been subjected to Buyer or Government specified qualification procedures to qualify the product or to permit the Seller to become a qualified source for the product, the Seller shall not change any process, material or procedure from that used to qualify without prior notification to Buyer and approval by the Buyer or the Government, as appropriate.
 - C. Resubmittal of Rejected Items: Articles rejected by the Buyer and subsequently resubmitted to the Buyer shall be clearly and properly identified as resubmitted articles. Seller's shipping document shall contain a

statement that the articles are replaced or reworked articles and shall also refer to Buyer's rejection document.

- D. Notification of Facility Change: Seller shall not relocate any production manufacturing and / or processing facility during the performance of the Order, without properly notifying the Buyer and affording the Buyer an opportunity to examine such facilities for compliance with Quality Assurance requirements, including any necessary approvals.
17. **Training** – Seller must maintain records of employee training specific to the process performed.