

Quality Clause Q2A First Article Inspection

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The terms “Item”, “PO”, and “Buyer” used herein have the same meaning as “work”, “contract”, and “Lockheed Martin”, respectively, as may be defined in another provision of the Purchase Order (PO) of which this Quality Clause Q2A is a part.

FOREWORD:

This document is being revised to align with current industry changes reflected within AS9102 Revision C. Also, updates have been made to maintain Buyer-unique requirements not specifically addressed within that standard.

Buyer has intentionally avoided duplication of content adequately covered within the AS9102 standard. Full understanding of Buyer’s requirements requires the concurrent use of AS9102 and Q2A. For guidance and industry best practices, consult the IAQG AS9102 Supply Chain Management Handbook (SCMH).

First Article Inspection (FAI) is a critical step in the introduction of new products into production that positions organizations for future success. Rigorous performance of the FAI on the first production run validates product realization planning, drives timely corrective action (*as-needed*), and accelerates the retirement of program risk. FAI should not be viewed as an isolated activity, but rather as a part of a system that neither begins nor ends with the FAI.

Proper planning for, conducting and accomplishing an FAI prior to delivery of the very first production deliverable is essential to the success of the FAI process. Including the right personnel at the beginning of the FAI planning stage is a fundamental part of a successful FAI. Section 4.1 of AS9102 Rev C has made significant changes for FAI planning requirements and should be thoroughly consulted prior to the beginning of any and all planning for product realization.

1. SCOPE:

- A. Unless otherwise stated, Seller shall comply with AS9102 and this Quality Clause at the highest revision levels in effect as of the date of the Request for Proposal (RFP) unless otherwise amended by Buyer and Seller prior to PO issuance. Seller may choose to work to a higher revision level of each at any point after PO acceptance.
- B. The requirements of this Quality Clause are applicable in full to the PO, including all products sub-indentured within the PO deliverable. This includes products manufactured, processed, assembled, tested or inspected at sub-tier suppliers. These requirements shall be flowed out to all sub-tier suppliers/processors contractually in order to assure compliance to this document.
- C. Buyer is the sole authority for interpretation of FAI requirements on the PO.
 1. For questions/interpretation of AS9102, Seller should first consult the AS9102 SCMHS published by IAQG for guidance. It is available online as public information at www.sae.org/iaqg.
 2. Questions about the interpretation of requirements contained within this document shall be sent on Buyer's Form 13113 to Buyer's SQM POC and the FAI Steering Committee via Seller's assigned Lockheed Martin Procurement Representative.
 3. In the case of conflict between this Quality Clause and AS9102, this Quality Clause (Q2A) shall take precedence.
- D. AS9102, including FAI forms, is available from the IAQG at:
<https://www.sae.org/iaqg/forms/index.htm>
- E. In addition to the AS9102 FAI application exclusions, the following categories of deliverables are excluded unless otherwise specified in the PO:
 1. Metallic raw material (*e.g., plate, bar, rod*) and non-metallic raw material (*e.g., paints, sealants, adhesives, composite ply prepreg material*)
 2. Products returned to Seller for repair or rework (*regardless of the aircraft program type/phase*)
 3. Tooling
- F. When the PO requires Last Article Inspection, conform to the requirements of this document except that the FAI shall be performed on the last production article to be delivered.

2. DEFINITIONS:

- A. Buyer – Indicates Lockheed Martin when used.
- B. Compliance Matrix – spreadsheet used to identify and verify distinct FAI design characteristics embedded within Lockheed Martin Material & Process (M&P) specifications; utilized as an extension of FAIR Form 3 to identify and verify those design characteristics; also used as a risk indicator for successful incorporation of compliance methods within a supplier's own manufacturing standardized planning, company command media, certified training programs, or other equivalent method.
- C. Critical Item – Products identified as Critical Safety Items, Fatigue Fracture Critical, Fracture Critical, Durability Critical, Maintenance Critical, Mission Abort Critical, Safety Critical and Flight Science Critical.

- D. FAI Planning – FAI-related activities performed prior to the first production run of parts.
- E. Non-Stockable Product: Product is engineered, planned, and manufactured to a specific aircraft Bill of Material (BoM) that is subject to significant configuration differences from one aircraft to another. Examples include, but are not limited to, major aircraft components such as a wing, fuselage section, and vertical/horizontal tail.
- F. Production – The act of manufacturing a product.
- G. Seller – Purchase Order (PO) recipient (e.g., supplying manufacturer, distributor, processor)
- H. Sub-Tier Supplier – All entities performing manufacturing, assembly, testing and inspection work on Seller’s behalf, including, but not limited to, suppliers at all levels, subcontractors, special processors, feeder plants, other Seller manufacturing sites, partners, etc.
- I. Stockable Product: Product is engineered, planned, and manufactured to a configuration that is common to multiple aircraft BoMs. (Most LM-procured products will conform to this definition).
- J. Technical Data Package (TDP) – The complete set of technical requirements necessary to communicate design intent. A TDP includes, but is not limited to: drawings, performance-based specifications, Digital Product Definition (DPD) media, process specifications, approved unincorporated engineering changes.

3. SUPPLEMENTAL INTERPRETATIONS:

This section provides additional requirements and guidance on AS9102 intent beyond the situations addressed within the AS9102 SCMH. Seller shall adopt the following:

- A. The AS9102 definition of “design characteristics” is comprehensive and includes all elements of the TDP at all levels of indenture. The completeness and accuracy with which Seller identifies all design characteristics is foundational to achieving the FAI’s stated purpose. AS9102 does not specifically require the identification/verification of individually embedded design characteristics within M&P process specifications. The Buyer regards those characteristics as essential to the verification process required on AS9102 Form 3 and expands the definition of design characteristics to include embedded characteristics that may affect fit, form, or function of the product. Buyer requires Seller to provide objective evidence of accounting for these design characteristics. This shall be accomplished either through the completion of Buyer-provided Compliance Matrices or a Seller-equivalent process structured to uniquely identify and verify all design characteristics, including those within each LM M&P process specification invoked within the TDP. Each Compliance Matrix or Seller-equivalent process shall be referenced in and attached to FAIR Form 3.
- B. The purpose of the FAI includes validation of the adequacy of measurement/inspection steps in the planned manufacturing process. Seller must be able to demonstrate through the FAI that the inspection steps and methods that are planned for recurring production will support the continued verification of product conformity.
- C. FAI requirements are derived from AS9100 “Production Process Verification” (PPV) which neither prescribes the method for performance and documentation nor discriminates between commodities or levels of complexity. FAI scope of detail parts and assemblies are now defined within AS9102. Buyer recognizes a fundamental difference in a product defined by a BoM that is unique to an aircraft tail number versus a product defined by a lower-level configuration with

broader effectivity. Buyer has established the following differentiating criteria and requirements:

1. Stockable Product (reference "Definitions" section): Seller shall meet the intent of PPV through compliance with all requirements contained within AS9102 and this Quality Clause.
2. Non-Stockable Product (reference "Definitions" section): Seller shall meet the intent of PPV (derived from AS9100) through compliance with the requirements of AS9102 and this Quality Clause with the following exceptions:
 - a. Seller is exempt from AS9102 forms requirements to document accomplishment of PPV at the Non-Stockable Product level. Seller shall produce and retain records satisfying all other AS9102 documentation requirements.
 - b. Seller shall perform a PPV on the first production run. (NOTE: The Seller should consult any existing command media on specific program PPV processes to determine existing requirements or to assess whether individual procedures could potentially be used as part of their PPV.) In lieu of performing partial or full PPVs for each subsequent production unit with unique BoM changes, Seller may meet the intent of PPV by demonstrating the adequacy of configuration management and control processes. Seller shall re-perform a full PPV at a frequency not to exceed every 3 years or 200 aircraft ship-sets, whichever occurs first, to validate the integrity of configuration management and control processes.
NOTE: *The intent here is to have regular surveillance activities to continue this validation.*

NOTE: *Seller shall apply Stockable/Non-Stockable Product criteria described above to internal production and sub-tier supplier sourcing to determine applicability of FAI and/or PPV requirements. Sub-indentured Stockable Products are subject to full FAI requirements.*

- D. Equipment and software associated with Acceptance Test Procedures (ATP) meet the AS9102 definition of Designed Tooling.
- E. Part marking verification requirements apply to both human and machine-readable formats.
- F. Buyer's Supplier Quality Engineer's (SQE) signature in block 24 (*Customer Approval*) of Form 1 does not transfer or limit Seller's liability for FAI compliance.

4. GENERAL REQUIREMENTS:

- A. Seller shall notify Buyer's assigned SQE, in writing, no less than five business days prior to each of the following distinct event occurrences:
 1. Seller procuring items or beginning any FAI Planning activity for the PO (ref. AS9102 FAI Planning within the Requirements section).
 2. Seller's planned start date for inspection of the first production run parts for the PO (*Seller must plan adequate time for Buyer's SQE to participate without impact to PO delivery schedule*).
 3. Implementing any changes as defined in AS9102 criteria for Partial or Re-accomplishment of First Article Inspection that affect products to be delivered under the PO.

- B. When Seller has manufactured and delivered products to a customer other than Buyer and can provide objective evidence of an FAI compliant to AS9102 and this Quality Clause within the prior two years from the date of the PO or more than two years prior with evidence of continual production to the same configuration as defined by the PO, Buyer will accept the previous FAI documentation as evidence of compliance to the requirements of this PO.
- C. Buyer's assigned SQE may elect to review or participate in Seller's FAI process at any time and may require in-process or final FAI validation hold points.
- D. Seller shall perform initial FAI on first production part to be delivered. Waivers and deferrals can only be granted by written authorization from Buyer's FAI Steering Committee via Lockheed Martin Procurement Representative on Buyer's Form 13710.
- E. Performance of a partial FAI based on similar parts (commonly referred to as "FAI by similarity") shall only be permitted by prior written authorization from Buyer's FAI Steering Committee via the Lockheed Martin Procurement Representative on Buyer's Form 13710 . FAI by similarity is not allowable for any products designated Interchangeable-Replaceable (I-R) or Critical, regardless of criticality category.
- F. Seller shall notify Buyer's SQE in writing of any proposal to use "similarity" to satisfy qualification requirements for a design change and shall provide supporting objective evidence of concurrence from Buyer's cognizant Engineering authority. (*Typically, applicable when Seller holds design authority*).
- G. Upon Buyer request, Seller shall provide a complete copy of FAI report(s) at all levels of indenture, including those of sub-tier suppliers.
- H. Buyer reserves the right to require Seller to perform a partial or full FAI for causes defined in AS9102 or for any reason causing Buyer to believe that the current production process lacks traceability to the TDP. Reasons why Buyer may invoke this requirement include, but are not limited to the following examples:
 - 1. Lost or destroyed FAI records.
 - 2. Non-conformance revealing a failure to account for Design Characteristic(s)
 - 3. Non-conformance revealing a failure to plan appropriate product verification steps
- I. Reference AS9102 and Appendix QX for control of non-conforming product discovered during the FAI. Delivery of non-conforming product with approved variances shall be as defined within the PO.
- J. When applicable for Critical Items, Seller must provide objective evidence of manufacturing plan approval from Buyer's engineering authority prior to start of first production run.
- K. When Buyer has approval authority for the ATP, including associated equipment or software when applicable, Seller shall not complete the FAI or deliver hardware without providing objective evidence of approval from Buyer's engineering authority to the Buyer's SQE.
- L. Seller must be able to demonstrate to Buyer's SQE that all design characteristics are identified and documented. AS9102 currently specifies the method to uniquely identify design characteristics through ballooning of relevant documents. Buyer requires Seller to use the ballooning technique on all design characteristics except for those already uniquely identified within a Buyer-provided Compliance Matrix (or Seller equivalent). Each non-conforming design

characteristic identified within the Buyer-provided Compliance Matrix (or Seller equivalent) shall be individually included within FAIR Form 3 fields 5 through 12.

NOTE: *Accomplishment logistics for verification of design characteristics are at Seller's discretion (i.e., which personnel perform the activities or whether previously performed verifications occurred for other purposes and are still valid for the current application).*

- M. When Buyer has imposed condition-of-supply definitions (e.g., *Production Operation Instruction Sheet [POIS]*) through the PO that modify/re-order released engineering requirements, the FAI shall reflect the condition-of-supply by ballooning them, listing them as requirements on Form3 Field 8 and verifying on Form 3 Field 9.
- N. Upon Buyer request, Seller shall provide objective evidence of AS9100 compliant configuration management and control processes that accurately and completely account for production process impacts resulting from configuration change activity common to Non-Stockable Products.
- O. Buyer's FAI Steering Committee retains the final authority to determine if Seller's deliverable meets the definition of "Non-Stockable Product". **NOTE:** *Seller should first contact their assigned SQE to help with this determination.*
- P. AS9102 includes direction to consider determination of the required objective evidence to be included in the FAIR for each design characteristic, including supporting documentation. Buyer requires the following minimum objective evidence documentation to be included within each FAIR package provided from Seller to Buyer:
 - 1. Approved AS9102 compliant FAIR forms 1, 2 & 3
 - 2. Approved Planning paperwork (e.g., shop traveler) showing the in-process verification steps of all PO-level product design characteristics. Any other Planning paperwork not related to the buy-off of these design characteristics is NOT required and may be extracted/redacted.
 - 3. Ballooned documents identifying all Buyer design characteristics defined within the TDP (this includes a two-dimensional representation of any DPD requirements) and within any Condition of Supply portions of the PO
 - 4. Applicable manufacturing plan approvals required by PO
 - 5. Inspection reports to support Form 3 (e.g., NDI/NDT data, CMM report)
 - 6. PO-level CoCs (both material and process as applicable)
 - 7. Any photos for Buyer design characteristics that require visual verification
 - 8. ATP results (as applicable)
 - 9. Casting/forging approvals (as applicable) in next higher assembly level FAIR package
 - 10. Weld maps (as applicable) in next higher assembly level FAIR package

5. REFERENCES:

- A. AS9102 [Aerospace First Article Inspection Requirement](#)
- B. AS9102 [Supply Chain Management Handbook \(SCMH\) Guidance](#)
- C. Buyer's Form 13113 [Supplier Request for Clarification of Purchase Order Quality Requirements](#)
- D. Buyer's Form 13710 [Request for FAI Waiver, Deferral, FAI by Similarity](#)