

Textron Systems Supplier Instruction

Title: Supplier First Article Inspection Instruction	Rev. C	Number: QA-SP52
	Authorized: J. Houk	Date: 4/30/18

NOTE: The change history of this Supplier instruction can be found at the end of this document.

1.0 SCOPE

- 1.1 Purpose is to provide instructions and guidance to Suppliers for performing First Article Inspections to the requirements of SAE AS9102.
- 1.2 The purpose of the First Article Inspection is to provide objective evidence that all engineering, design and specification requirements are correctly understood, accounted for, verified, and recorded. That planning, work instructions, material processing systems and controls, tools, gages, and fixtures, inspection/test equipment will produce an item in compliance to the applicable purchase order, drawing and specification requirements.

2.0 REFERENCED DOCUMENTS

- 2.1 SAE AS 9102 – Aerospace First Article Inspection Requirement (Latest revision)
 - 2.1.1 Copies of AS9102 may be obtained from Society of Automotive Engineers at: www.sae.org
 - 2.1.2 AS 9102 Forms 1, 2 and 3 can be obtained at: <http://www.sae.org/aagg/publications/as9102a-faq.htm>

3.0 DEFINITIONS AND ACRONYMS

FAI – First Article Inspection.

COTS – Commercial Off the Shelf – COTS items are defined as product that is shown in a Suppliers catalog and can be purchased by the general public.

DESIGN CHARACTERISTICS - Those dimensional, visual, functional, mechanical, and material features or properties, which describe and constitute the design of the article as specified by Drawing Requirements. These characteristics can be measured, inspected, tested, or verified to determine conformance to the design requirements. Dimensional features include in-process locating features such as target-machined (or forged/cast) dimensions on forgings and castings, and, weld/braze joint preparation necessary for acceptance of finished joint. Material features or properties may include processing variables and sequences, which are specified by the drawing (e.g., heat treat temperature, fluorescent penetrant class, ultrasonic scans, sequence of welding and heat treat). These provide assurance of intended characteristics that could not be otherwise defined.

DRAWING REQUIREMENTS - Requirements of the drawing (including Parts Lists), specification, or purchasing document to which the article is to be made. These include any notes, specifications, and lower-level drawings invoked.

PRODUCT - The result of a process, which in the context of this instruction, includes finished detailed parts and assemblies, forgings and castings.

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4.0 APPLICABILITY

- 4.1 FAI shall be performed IAW requirements set forth in the PO, SOW or other contractual document, typically in the form of a B9 PO code.
- 4.2 **Once invoked**, FAI must be performed when any of the following events occur;
1. A change in the design affecting fit, form or function of the part.
 2. A change in manufacturing source(s), process (es), inspection method(s), location of manufacture, tooling or materials that can potentially affect fit, form or function.
 3. A change in numerical control program or translation to another media that can potentially affect fit, form or function.
 4. A natural or man-made event, which may adversely affect the manufacturing process.
 5. A lapse in production for two years.
- 4.3 FAI must be performed at the final assembly, sub-assembly and detail part levels. Each subassembly requires a separate sub-assembly FAI and must be listed on Form 1.
- 4.4 Supplier of source control drawing items must conform to the contents of this document. This includes all details and assemblies within the Supplier's control (i.e. Supplier's drawings).
- 4.5 The following items do not require an FAI, unless otherwise directed by the buyer:
1. Standard catalog hardware, (AN, MS standard hardware, etc) electronic piece parts and software.
 2. COTS items
 3. Metallic (plate, bar rod, etc) and non-metallic (paints, sealants, adhesives, etc.) raw materials.
 4. Objective evidence that FAI has been completed in the last two years.
- 4.6 All requirements imposed by this instruction and AS9102 must be imposed on any sub-tier Suppliers.

5.0 GENERAL REQUIREMENTS

- 5.1 The FAI shall be performed on product that is representative of the first production run. It is highly preferred that FAI is performed on the first piece from the production lot. Any nonconformances found during the FAI shall require that all product in the lot be reworked/repared.
- 5.2 FAIs shall be documented on the forms contained in the Appendix to AS9102 and in accordance with instructions in Paragraph 5.5 of the standard and the instructions included with the forms. Forms other than those contained in AS9102 may be used, however they shall contain all "Required" and "Conditionally Required" information and have the same field reference numbers. All fields shall be addressed but may be marked as "not applicable" (N/A) if appropriate.

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- 5.3 Each engineering design characteristic shall be checked by direct measurement with currently calibrated measuring devices. Results from inspection of design characteristics shall be expressed in quantitative terms (variables data) when a design characteristic is expressed by numerical limits. The results recorded shall be in the units specified on the drawing or specification and shall be checked with currently calibrated measuring devices. CMM reports for models must indicate points inspected, tolerances and actual measurements recorded must be included in the FAI report.
- 5.4 Attribute data (e.g., go/no go, accept, pass, etc) may be used if no inspection technique resulting in variables data is feasible. Attribute data is permitted when the design characteristic does not specify numerical limits (e.g., break all sharp edges, markings, safety wire, etc).
- 5.5 Every design characteristic and drawing requirement, including drawing notes, shall have its own unique characteristic number. The numbers shall be recorded on the drawing(s) adjacent to the characteristic in addition to the form. These drawing(s) must be part of the FAI package.
- 5.6 In addition to the completed forms for the final assembly and sub-assemblies, the FAI report shall contain the following items:
1. Material certifications for all raw materials, metal, plastic, composite, printed wiring boards, etc. The certification must reflect the material/process specification that is stated in the drawing. A simple "Certificate of Conformance" stating the material complies with the drawing requirements is not acceptable.
 2. Certifications for all special process (heat treat, chemical coatings, nondestructive testing, paint, welding, etc.)
 3. Objective evidence (Certificate of Conformance or packing list) that all components used in the final assembly/sub-assembly matches the part number required by the drawing/parts list.

NOTE: Complex Printed Wiring Assemblies with many parts do not require a Certificate of Conformance or packing list for every component. Supplier's certification of conformance / packing list on file is acceptable. AAI reserves the right to perform a sample audit in order to verify compliance.
 4. Functional test reports (Data Sheets) from the final test, if applicable.
 5. Any discrepancies or non-conformances discovered during the FAI shall be documented and dispositioned by the appropriate Material Review Board. All rejection documentation, buyer's/seller's dispositions and corrective action shall become part of the FAI report.
- 5.7 Special tools (jigs, templates, fixtures, etc.) that are fabricated to be used as a media of inspection shall not be utilized for the FAI. Part specific gages and/or tooling must be qualified and traceable, as applicable.

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- 5.8 If the product is assembled to a document other than the actual drawing (work instruction, traveler, planning, etc.), as part of the FAI review, the AAI representative will perform a review of the assembly “build documentation” to ensure the accuracy and adequacy of the build documentation and that all drawing requirements have been included in the build documentation.
- 5.9 Once the initial FAI has been completed and approved, the FAI requirement, once invoked, shall continue to apply even after initial compliance. The FAI requirements may be satisfied by a partial (delta) FAI that addresses differences between the current configuration and prior approved configurations. A full FAI or a partial FAI shall be performed for the affected characteristics when any of the following events occur:
1. A change in the design affecting fit, form or function of the part.
 2. A change in manufacturing source(s), process (es), inspection method(s), location of manufacture, tooling or materials that can potentially affect fit, form or function.
 3. A change in numerical control program or translation to another media that can potentially affect fit, form or function.
 4. A natural or man-made event, which may adversely affect the manufacturing process.
 5. A lapse in production for two years.

CHANGE HISTORY			
Version	Date	Author	Description
-	8/31/2009	B. McCaffery	Initial Release
A	03/01/2012	M. Nussbaum	Updated for production run and FAI inspection performance requirements.
B	3/20/15	M. Nussbaum	Three-year review. No updates necessary.
C	4/30/2018	J. Houk	Changed AAI to Textron Systems. Clarified in 4.1 & 4.2 that FAI only applies when contractually obligated.