

AIE (UK) Ltd

First Article Inspection

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Requirements



AS9102 Rev B - Aerospace First Article Inspection Requirement

Invoked by AS9100:

7.5.1.1 Production Process Verification

The organization shall use a representative item from the first production run of a new part or assembly to verify that the production processes, production documentation and tooling are capable of producing parts and assemblies that meet requirements. This activity shall be repeated when changes occur that invalidate the original results (e.g., engineering changes, manufacturing process changes, tooling changes).

NOTE This activity can be referred to as first article inspection.

NOTE: See (AS) (EN) (SJAC) 9102 for guidance

Definition



FIRST ARTICLE INSPECTION (FAI):

A planned, complete, independent, and documented inspection and verification process to ensure that prescribed production methods have produced an item conforming to engineering drawings, Digital Product Definition (DPD), planning, purchase order, engineering specifications, and/or other applicable design documents.

Ref AS9102 Rev B

Purpose

Provides objective evidence that:

All engineering design and specification requirements are

- understood
- accounted for
- verified
- and documented

i.e. Process and Manufacturing validation

When should a FAI be performed?

- Full FAI
 - New part introduction
 - New supplier or new location of manufacture
 - Lapse in production for more than 2 years
 - When required by the customer
- Partial (Delta) FAI
 - Design change that affects fit, form, or function
 - Significant change in the method of manufacture (e.g. Tooling, Processes, Machine, Location, Numerical Control Program, Sequence of Manufacture)

What does it apply to?



- All parts defined by drawings issued by the customer
- Assemblies
- All levels of detail parts within assembly (including castings and forgings)
- Procured standard catalogue items, COTS items, Electronic and Deliverable Software

COTS - Commercially available items intended by design to be procured and utilised without modification e.g. common electronic components, Standards, nuts, bolts, screws, washers

Deliverable Software - Embedded or loadable airborne, spaceborne or ground support or firmware components

What does it not apply to?



- Development and prototype parts that are not considered as part of the first production run
- Unique single run production orders, not intended for ongoing production

No FAI required

What is included?



- Verification of all design characteristics
- Material and Special Process Certifications
- Manufacturing Process Verification
- Non-conformance resolution
- FAIRs for major Sub-Assemblies

Forms



The Following Forms comprise a First Article Inspection Report (FAIR)

AS9102 Form 1: Part Number Accountability shall be used to identify the part that is being first article inspected (FAI part) and associated sub-assemblies or detail parts.

AS9102 Form 2: Product Accountability – Raw Material, Specifications and Special Process(s), Test Verification shall be used if any material, special processes or functional testing are defined as a design requirement.

AS9102 Form 3: Characteristic Accountability, Verification and Compatibility Evaluation shall be used to record an actual measurement or inspection/verification of the FAI part for every design characteristic on the drawing, including notes.

Note: The standard Form 3 in this tutorial has been modified to include a column for the recording of measurement equipment used during the inspection of the FAI part.

Forms

1. Part Number	2. Part Name	3. Serial Number	4. FAI Report Number
5. Part Revision Level	6. Drawing Number	7. Drawing revision level	8. Additional Changes
9. Manufacturing Process Reference	10. Organization Name	11. Supplier Code	12. P.O. Number
13. Detail FAI <input type="checkbox"/>	14. Full FAI <input type="checkbox"/>	Baseline Part Number including revision level	
Assembly FAI <input type="checkbox"/>	Partial FAI <input type="checkbox"/>	Reason for Partial FAI:	
a) if above part number is a detail part only, go to Field 18			
b) if above part number is an assembly, go to the "INDEX" section below.			
INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.			
15. Part Number	16. Part Name	17. Part Serial Number	18. FAI Report Number

YELLOW or LIGHT GREY fields – MANDATORY information required.

BLUE or DARK GREY fields – CONDITIONALLY REQUIRED. These fields must be completed when information is available.

WHITE fields – OPTIONAL information required when available.

1) Signature indicates that all characteristics are accounted for; meet drawing requirements or are properly documented for disposition.	
2) Also indicate if the FAI is complete per Section 5.4: <input type="checkbox"/> FAI complete	<input type="checkbox"/> FAI not Complete
19. Signature By	20. Date
21. Reviewed By	22. Date
23. Customer Approval	24. Date

Form 1 – Part Number Accountability



1. Part Number	2. Part Name	3. Serial Number	4. FAI Report Number
5. Part Revision Level	6. Drawing Number	7. Drawing revision level	8. Additional Changes
9. Manufacturing Reference			
Assembly FA			
a) if ab			
b) if ab			
IND			
15. Part Number			

Box 1. Part Number of the FAI part.

Box 2. Name of the part as shown on the drawing.

Box 3. Serial number of the FAI part.

Box 4. The Report No.

Box 5. The revision of the part being first article inspected. Indicate if there is no revision.

Note: The latest revision (Box 7) does not always affect all parts contained on a drawing.

**Box 6. The drawing number associated with the FAI part.
(if different from part number)**

**Box 7. Reference the revision engineering drawing.
(if drawing number is different from part number)**

**Box 8. Reference ECO authorized changes affecting the FAI part,
not reflected by the current part/drawing revision level.**

Form 1 – Part Number Accountability



1. Part Number	2. Part Name	3. Serial Number	4. FAI Report Number
5. Part Revision Level	6. Drawing Number	7. Drawing revision level	8. Additional Changes
9. Manufacturing Process Reference	10. Organization Name	11. Supplier Code	12. P.O. Number
13. Detail FAI <input type="checkbox"/> Assembly FAI <input type="checkbox"/>	14. Full FAI <input type="checkbox"/> Partial FAI <input type="checkbox"/> Reason for Partial FAI:	Baseline Part Number including revision level	
a) if above part number is a detail part only, go to Field 18 b) if above part number is an assembly, go to the "INDEX" section below.			
IND	15. Part N		e.

Box 9. Reference internal manufacturing

Box 10. Name of the organization performing the FAI .

Box 11. Reference the supplier vendor code.

Box 12. Reference the customer Purchase Order number.

Box 13. Check as appropriate.

Box 14. Check as appropriate. For Partial FAI provide the baseline drawing number, including issue status and the reason. i.e Change of manufacturing location, Non-Conformance, Process change, Design change etc.

Form 1 – Part Number Accountability



1. Part Number	2. Part Name	3. Serial Number	4. FAI Report Number
5. Part Revision Level	6. Drawing Number	7. Drawing revision level	8. Additional Changes
9. Mat. Ref.			
13. D			
Assembly Part <input type="checkbox"/>		Reason for Part # Fail.	
a) if above part number is a detail part only, go to Field 18 b) if above part number is an assembly, go to the "INDEX" section below.			
INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.			
15. Part Number	16. Part Name	17. Part Serial Number	18. FAI Report Number

Boxes 15, 16, 17 and 18 – this section is only required if the Part Number in Box 1. is an Assembly with lower level parts.

Box 15. Reference all lower level parts or next level sub-assembly Part Number.

Box 16. Part name as shown on the drawing/ parts list.

Box 17. Reference the serial number of the part.

Box 18. A reference number that identifies the FAI package.

Form 1 – Part Number Accountability



1) Signature indicates that all characteristics are accounted for; meet drawing requirements or are properly documented for disposition.	
2) Also indicate if the FAI is complete per Section 5.4: <input type="checkbox"/> FAI complete <input type="checkbox"/> FAI not Complete	
19. Signature By	20. Date
21. Reviewed By	22. Date
23. Customer Approval	24. Date

Box 19. The name and signature of the person who prepared the FAI.

Box 20. Date when the FAI was prepared.

Box 21. The name of the person who reviewed or approved the FAI package.

Box 22. Date when the FAI was reviewed.

Box 23. Customer Approval.

Box 24. Date of Customer approval.

Form 2 – Product Accountability



1. Part Number	2 Part Name		3. Serial Number		4. FAI Report Number
5. Material or Process Name	6. Specification Number	7. Code	8. Special Process Supplier Code	9. Customer Approval Verification (Yes/No/NA)	10. Certificate of Conformance number

Box 5. Enter the name of the material or process i.e. Aluminium Alloy, Cadmium Plate etc.

Box 6. Enter the material or process specification number, class and material form i.e. AMS4928 Bar (Include 'make from' materials, weld/ braze filler materials, standard catalogue hardware etc).

Box 7. Reference any material code specified.

Box 8. Reference Special Process Supplier Vendor code.

Box 9. Indicate if technical approval is required by the customer.

Box 10. Reference Certificate of Conformance number(s) e.g. Special Process, Raw material & Mill certifications, Laboratory Reports etc.

Ballooned Drawing



- A ballooned drawing is a required element of a FAIR package to support Box 5 of Form 3
- Identify 100% of contracted* characteristics:
 - Balloon and number all dimensions
 - Balloon and number all surface finish callouts
 - Including exclusion and inclusion area callouts
 - Balloon and number all material and hardness callouts
 - Don't forget the requirements identified in the title boxes at the bottom of the drawings.
- Note callouts are identified as such on Form 3 e.g. Note1, Note 2 etc.
- *If part is shipped incomplete per the Purchase Order(PO), Statement Of Work(SOW), account for the excluded characteristics by indicating in balloon or adjacent to note the coded reason.

Form 3 – Characteristic Accountability Verification and Compatibility Evaluation



1. Part Number				2. Part Name			3. Serial Number	4. FAI Report
Characteristic Accountability				Inspection / Test Results				
5. Char No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	14. Measurement Equipment (FAI)	11. Non-Conformance Number	10. Designed Tooling	

Box 14. Reference measurement equipment used for FAI.
 (Note: The standard Form 3 in this tutorial has been modified to include a column for the recording of measurement equipment used during the inspection of the FAI part and is required only if requested.)

Box 11. Record non-conformance document reference number if any design characteristic is found non-conforming.

Box 10. Record the tool identification number of specially designed tooling used as a media of inspection.

The signature indicates that all characteristics are accounted for; meet drawing requirements or are properly documented for disposition.

12. Prepared By	13. Date
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First Article Inspection



•FAI Completion & Verification

- Results compiled by person independent to process
- Results reviewed independently and signed

•Customer Acceptance

- Submitted FAI Report and Part are verified by Customer personnel.
- Results are fed back to supplier
 - If acceptable, signed sheets sent to Supplier for the record.
 - If unacceptable, processed via Non-Conforming Material procedure