



**TRANSITION TOGETHER**



# GUIDE FOR SUCCESSFUL COMPLETION OF FIRST ARTICLE INSPECTION (FAI) REPORTS

REV. B  
17 OCT 2017  
[www.iaqg.org/scmh](http://www.iaqg.org/scmh) Section 3.2.3

From IAQG SCMH 10/7/2019

## Introduction

- This presentation is intended as supplemental information in support of the 9102 Standard for Aerospace First Article Inspection requirements.
- This material should be used in conjunction with the standard. The requirements cited in the standard always take precedent.

# Purpose

The primary purpose of FAI is to validate that product realization processes are capable of producing parts and assemblies that meet engineering and design requirements. A well-planned and executed FAI will provide objective evidence the manufacturer's processes can produce compliant product and that they have understood and incorporated associated requirements. FAI will:

- Provide confidence that the product realization processes are capable of producing conforming product.
- Demonstrate that the manufacturers and processors of the product have an understanding of the associated requirements.
- Provide objective evidence of process capability.
- Reduce potential risks associated with production startup and/or process changes.
- Provide assurance of product conformance at the start of production and after changes outlined in this standard.

## Definition

### *FIRST ARTICLE INSPECTION (FAI)*

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

Ref 9102 Rev B, Sec 3.10

## Planning Activities

The organization should consider the following activities during FAI planning and coordinate planning with the customer, if required:

- Determination of design characteristic inspection and sequencing for inspection of characteristics not measurable in the final product.
- Extraction of DPD design characteristics required for product realization that are not fully defined on 2D drawings, including tolerances for nominal dimensions.
- Determination of objective evidence to be included in the FAIR for each design characteristic.

## Planning Activities

- Determination that approved special process, laboratory, material, and customer required sources are identified, as applicable, and that the manufacturing planning, routing, and purchase document calls out the correct specification and relevant sources.
- Determination that key characteristic and critical item requirements are identified, as applicable (see IAQG standards 9100 and 9103 for guidance/direction).
- Determination when part specific gauges and tooling are required. These gauges and tooling are identified, qualified, and traceable, as appropriate.
- Provide for customer FAI review, if required.
- Identification of events requiring an updated FAI (see 4.6).

## Evaluation Activities

The organization shall conduct the following activities during product realization, when applicable, in support of FAI to ensure conformance with design characteristics:

- Review documentation for the manufacturing process (e.g., routing sheets, manufacturing or quality plans, manufacturing work instructions) to ensure all operations are complete as planned and call out the correct specification, material types, conditions, and approvals.
- Review supporting documentation in the FAI (e.g., inspection data, test data, Acceptance Test Procedures, special process approvals and certifications) for completeness.
- Verify that the raw material and special process certifications call out the correct specification, material types, conditions, and approvals.

## Evaluation Activities

- Verify that required customer approved sources are utilized.
- Review nonconformance documentation included in the FAIR for completeness.
- Verify that required designed tooling (e.g., part specific gauges) are used and appropriately documented on Form 3.
- Verify that every design characteristic requirement is accounted for, uniquely identified, and has inspection results traceable to each unique identifier.
- Verify the design characteristics that are the output of the manufacturing process are measured, inspected, tested, or verified to determine conformance, including DPD characteristics as required per 4.3.b.
- Verify part marking is legible, correct in content and size, and properly located per applicable specifications.



## When should FAI be performed?

The organization shall perform a full FAI or a partial FAI for affected characteristics, when any of the following occurs:

- A change in the design characteristics affecting fit, form, or function of the part.
- A change in manufacturing source(s), process(es), inspection method(s), location of manufacture, tooling, or
- A change in numerical control program or translation to another media that can potentially affect fit, form, or function.
- A natural or man-made event, which may adversely affect the manufacturing process.
- An implementation of corrective action required to complete a previous FAI, as described in 4.4.
- A lapse in production for two years shall require an update for any characteristics that may be impacted by the inactivity. This lapse is from the completion of last production operation to the actual restart of production.

## What does it apply to?

Organizations that are responsible for producing the design characteristics of the product (i.e., product realization). The organization shall flow down the requirements of this standard to suppliers or processors who produce design characteristics.

- Assemblies
- Sub-assemblies
- Detail Parts
  - Castings
  - Forgings
  - Modifications to Standard Catalogue or Commercial-Off-the-Self (COTS) items.

What does it not apply to?

Unless contractually required, this standard does 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 (e.g., out-of-production spares).
- Procured standard catalogue items, COTS, or deliverable software.

No FAI required

## What is included?

- Part Number Accountability
- Accountability – Materials, Special Processes, and Functional Testing
- Characteristic Accountability, Verification, and Compatibility Evaluation
- Supporting Documentation

## Forms

The Following Forms comprise a First Article Inspection Report (FAIR) full instructions in 9102 appendix A

- 9102 B Form 1: Part Number Accountability, shall be used to identify the product that is having the First Article Inspection (FAI) conducted on (e.g., detail part, subassembly, assembly); referred to as "FAI part".
- 9102 B Form 2: Product Accountability – Materials, Special Processes, and Functional Testing, shall be used if any materials, special processes, or functional testing is defined as a design characteristic.
- 9102 B Form 3: Characteristic Accountability, Verification and Compatibility Evaluation, shall be used to record inspection results for the design characteristics and to document any applicable non-conformances.

# AS9102 B Form 1 – Part Number Accountability

1. Part Number:	2. Part Name:	3. Serial/Number:	4. FAIR 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 Part Assembly FAIR:	14. Full FAIR: _____ Baseline Part Number (including revision level): _____ Reason for Partial FAIR: _____		

a) If above part number is a detail part only, go to field 1.  
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.

**Bold Font – MANDATORY information required.**

**Bold Italic Font – CONDITIONALLY REQUIRED.**  
These fields must be completed when information is available.

**Standard Font – OPTIONAL information required when available.**

# AS9102 B Form 1 – Part Number Accountability

**REQUIRED**

**CONDITIONALLY REQ**

**OPTIONAL**

1. Part Number:	2. Part Name:	3. Serial Number:	4. FAIR 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:
<b>Box 1. Part Number of the FAI part.</b>			
13. Detail Part: _____	14. Full FAI: _____	Partial FAI: _____	
Assembly FAI: _____ (Baseline Part Number (including revision level)):			
<b>Box 2. Name of the FAI part.</b>			
a) If above part number is a detail part only, go to field 19. b) If above part number is an assembly, go to the "INDEX" section below.			
INDEX			
15. Part Num			above.
			yr.
<b>Box 3. Serial number of the FAI part.</b>			
<b>Box 4. Reference number that identifies the First Article Inspection Report (FAIR).</b>			



REQUIRED

CONDITIONALLY REQ

OPTIONAL

# AS9102 B Form 1 – Part Number Accountability

1. Part Number:	2. Part Name:	3. Serial Number:	4. FAIR 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:

**Box 5.** Latest revision that affects the FAI part being inspected. If the part has not been revised, indicate as such (e.g., N/C, No Change).  
 Note: The latest revision (Box 7) does not always affect all parts contained on a drawing.

a) If above part number is a detail part only, go to field 19.

b) If above part number is an assembly, go to the "MFG CYS" section below.

**Box 6.** The drawing number or DPD data set associated with the FAI part.

**Box 7.** The revision level of the drawing or DPD data set associated with the FAI part.

**Box 8.** Provide reference numbers of any changes that are incorporated in the product, but not reflected in referenced drawing/part revision level.





REQUIRED

CONDITIONALLY REQ

OPTIONAL

# AS9102 B Form 1 – Part Number Accountability

1. Part Number:	2. Part Name:	3. Serial Number:	4. FAIR 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:

**Box 9. Reference number that provides traceability to the manufacturing record of the FAI part.**

**Box 10. Name of the organization performing the FAI .**

INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.

**Box 11. A unique number given by customer to the organization.**

**Box 12. Customer Purchase Order number.**



# AS9102 B Form 1 – Part Number Accountability

**REQUIRED**

**CONDITIONAL REQ**

**OPTIONAL**

1. Part Number:	2. Part Name:	3. Serial Number:	4. FAIR 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 Part: _____ Assembly FAI: _____	14. Full FAI: _____ Baseline Part Number (including revision level): _____	Partial FAI: _____	
Reason for Partial FAI:			
a) If above _____ b) If above _____			
INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.			

**Box 13. Check as appropriate.**

**Box 14. Check as appropriate. For a partial FAI, provide the previous part number, including revision level to which this partial FAI is performed and the reason for the current FAI. For partial FAIs based on similar parts provide the approved configuration FAI part number, including revision level.**



# AS9102 B Form 1 – Part Number Accountability

**REQUIRED**

**CONDITIONALLY REQUIRED**

**OPTIONAL**

1. Part Number:	2. Part Name:	3. Serial Number:	4. FAIR Number:
5. Part Revision:	<p><b>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.</b></p>		
6. Part Changes:			
7. Manufacturer Reference Number:			
<p><b>Box 15. Part number included in the assembly and items from the BOM included in the drawing, DPD, or next level assembly.</b></p>			
<p>Reason for Partial FAI:</p> <p><b>Box 16. Name of the part installed in the assembly.</b></p>			
<p>a) If above part number is an assembly, go to the "INDEX" section below.</p>			
<p>INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.</p>			
15. Part Number:	16. Part Name:	17. Part Serial Number:	18. FAIR Number:
<p><b>Box 17. Serial number of the part that is installed in the assembly.</b></p>			
<p><b>Box 18. Report number for the detail parts and associated assemblies.</b></p>			



REQUIRED

CONDITIONALLY REQ

OPTIONAL

# AS9102 B Form 1 – Part Number Accountability

**Box 19. Printed name or unique identification, and signature of the person approving the FAIR.**

**Box 20. Date when field 19 was signed.**

**Box 21. Printed name or unique identification, and signature of the person from the organization who approved the FAIR.**

**Box 22. Date when field 21 was signed.**

**Box 23. Used by customer to record approval, if required.**

**Box 24. Date when field 23 was signed.**

19. Signature:	FAI Complete	FAI Not Complete	20. Date:
21. Reviewed By:			22. Date:
23. Customer Approval:			24. Date:



# AS9102 B Form 2 – Product Accountability

**REQUIRED**

**CONDITIONALLY REQD**

**OPTIONAL**

1. Part Number:	2. Part Name:	3. Serial Number:	4. FAIR Number:				
5. Material or Process Name:	6. Specification Number:	7. Code:	8. Supplier:				
		9. Customer Approval Verification:	10. Certificate of Conformance Number:				
<b>Boxes 1 - 4 are repeated on all forms for convenience and traceability.</b>							



# AS9102 B Form 2 – Product Accountability

REQUIRED

CONDITIONALLY REQ

OPTIONAL

**Box 5. Name of applicable materials or special processes.**

5. Material or Process Name:	6. Specification Number:	7. Code:	8. Supplier:	9. Customer Approval Verification:	10. Certificate of Conformance Number:
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**Box 6. Material specifications and material form for all materials incorporated into the FAI part. Special process specifications; including class, if applicable, and permitted substitutions. If standard catalogue items or COTS are modified, then list that standard hardware or COTS item.**

**Box 7. Any required code from the customer for material or process listing.**

**Box 8. Identify supplier name, address, and code performing special processes or supplying material.**

**Box 9. Indicate if the special process(es) or material sources are approved by the customer.**

**Box 10. The applicable certificate number.**

# AS9102 B Form 2 – Product Accountability

REQUIRED

CONDITIONALLY REQ

OPTIONAL

11. Functional Test Procedure Number:	12. Acceptance Report Number:
<b>Box 11. Functional Test Procedure number identified as a design characteristic.</b>	
<b>Box 12. The functional test certification indicating that test requirements have been met.</b>	
13. Comments	15. Date
14. Signature	

**Box 13. Provide supporting comments, as applicable.**

**Box 14. Printed name or unique identification, and signature of the person who prepared and approved this form.**

**Box 15. Date when field 14 was signed.**



**REQUIRED**

**CONDITIONALLY REQ**

**OPTIONAL**

# AS9102 B Form 3- Characteristic Accountability, Verification and Compatibility Evaluation

1. Part Number	2. Part Name	3. Serial Number	4. FAIR Number
Characteristic Accountability			
5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement
Inspection / Test Results		9. Results	10. Designed / Qualified Tooling
		11. Nonconformance Number	14. Additional Data / Comments
12. Signature		13. Date	

**Boxes 1 - 4 are repeated on all forms for convenience and traceability.**





# AS9102 B Form 3- Characteristic Accountability, Verification and Compatibility Evaluation

**REQUIRED**

**CONDITIONALLY REQ**

**OPTIONAL**

1. Part Number		2. Part Name				3. Serial Number		4. FAIR Number	
Characteristic Accountability		Inspection / Test Results		14. Additional Data / Comments					
		5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement			9. Results	10. Designed / Qualified Tooling

**Box 5. Unique assigned number for each design characteristic.  
NOTE: A single design callout that applies to multiple characteristics may be recorded as one characteristic number.**

**Box 6. Location of the design characteristic.**

**Box 7. If applicable, record characteristic type.**

12. Signature 13. Date



# AS9102 B Form 3- Characteristic Accountability, Verification and Compatibility Evaluation

REQUIRED

CONDITIONALLY REQ

OPTIONAL

1. Part Number		2. Part Name		3. Serial Number		4. FAIR Number	
Characteristic Accountability				Inspection / Test Results			
5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	10. Designed / Qualified	11. Nonconformance Number	14. Additional Data / Comments

**Box 8. Specified requirement for the design characteristic.**

- Box 9. List measurement(s) obtained for the design characteristics.**
- For multiple characteristics list each characteristic as individual values or list once with the minimum and maximum of measured values attained. If a characteristic is found to be nonconforming, then that characteristic shall be listed separately with the measured value noted.
  - When qualified tooling (e.g., radius gauges) is used as a go/no-go gauge (reference 9102, 4.7.3.b), record the results as an attribute (e.g., pass / fail).
  - When automated inspection tooling produces measurement results, those results may be referenced on 9102 Form 3, identified as pass/fail, and attached only when:
    - The characteristic numbers are clearly linked in the attached report.
    - The results in the attached reports are clearly traceable to the characteristic numbers.
    - The results are directly comparable to the design characteristic.
  - If a design requirement requires verification testing, record the actual results on the form. If a laboratory report or certificate of test is included in the FAIR, the results may be recorded as an attribute (e.g., pass / fail) and the test reference number recorded on the forms. The laboratory report or certificate of test shall show specific values for requirements and actual results.
  - For characteristics with visual verification requirements that are rated against standard photographs, list the photo number of the closest comparison. A statement of conformance is acceptable; record the reference number on the forms.
  - For processes that require verification per design characteristics, include a statement of conformance (e.g., certification of conformance, verification indicator - accept).
  - For characteristics verified by attribute inspection include statement of conformance (e.g., accept).



# AS9102 B Form 3- Characteristic Accountability, Verification and Compatibility Evaluation

**Required**

**Conditionally Req**

**OPTIONAL**

1. Part Number		2. Part Name		3. Serial Number	4. FAIR Number
Characteristic Accountability					
5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	10. Designated / Qualified Tooling
				11. Nonconformance Number	
14. Additional Data / Comments					
12. Signature					13. Date

**Box 10. When design tooling or specially designed tooling, including NC programming as a media of inspection, is used for attribute acceptance of the characteristic, record the tool identification number. When qualified tooling is used for attribute acceptance, record the gauge value or range, as applicable.**

**Box 11. If the characteristic is found to be nonconforming, record a nonconformance document reference number.**

**Box 14. This area is reserved for optional fields; add additional columns, as required, by the organization or customer.**



# AS9102 B Form 3- Characteristic Accountability, Verification and Compatibility Evaluation

**REQUIRED**

**CONDITIONALLY REQ**

**OPTIONAL**

1. Part Number		2. Part Name		3. Serial Number		4. FAIR Number	
Characteristic Accountability				Inspection / Test Results			
5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	10. Designated / Qualified Tooling	11. Nonconformance Number	14. Additional Data / Comments
12. Signature		13. Date					

**Box 12. Printed name or unique identification, and signature of the person who prepared and approved this form. Signature indicates that all applicable design characteristics are accounted for and meet requirements or are properly documented**

**Box 13. Date when field 12 was signed.**



## Forms and FAQ Links

9102 B forms can be downloaded at:

<http://www.sae.org/iaqg/forms/index.htm>

9102 FAQ Link

<http://www.sae.org/iaqg/publications/faq9102.pdf?>

## Most Common Reasons for FAIR Rejection

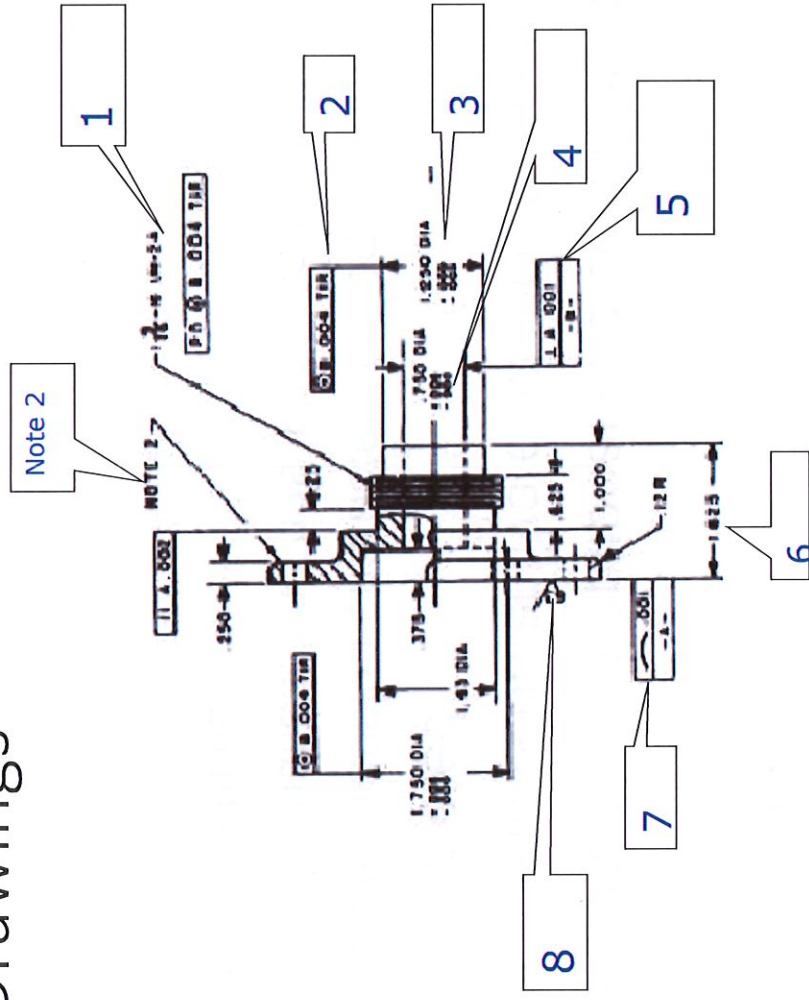
- Customer required supporting documentation does not accompany the FAI Report.
- Does not account for all design characteristics.
- Variable data requirements from the engineering drawing are not provided with numerical results.
- Missing or wrong information provided.
- Missing special processor full address on AS9102 B Form 2, box 8.
- Missing tolerances on AS9102 B Form 3, box 8.



## Ballooned Drawings

- A ballooned drawing is optional and considered an industry best practice and is objective evidence to show that 4.5.g has been completed.
- Verify that every design characteristic requirement is accounted for, uniquely identified, and has inspection results traceable to each unique identifier.

# Ballooned Drawings



Note: In this example not all characteristics ballooned



## 9102 Contact:

If you have a specific question for the writers of 9102 you can contact the International Document Representative IDR or the Sector Document Representative SDR directly by going to the Standards Register.

Access the IAQG Standards Register By going to:

[http://www.sae.org/iaagg/publications/standards/register\\_tracking\\_matrix.pdf](http://www.sae.org/iaagg/publications/standards/register_tracking_matrix.pdf)

Support & Resources course

# SCMH Guidance contact:

Access the SCMh by going to:

[www.iaqg.org/scmh](http://www.iaqg.org/scmh)

Your feedback and comments are welcome, just click on "Take Survey"

The screenshot displays the homepage of the Supply Chain Management Handbook (SCMH) website. At the top left is the IAQG logo (International Aerospace Quality Group). The main header features the title "Supply Chain Management Handbook (SCMH)" and navigation links for "Logout" and "Manage Account". A search bar is located at the top right. Below the header is a horizontal menu with seven numbered items: 1 Market & Sell, 2 Design & Develop, 3 Make, 4 Buy, 5 Deliver, 6 Customer Support, and 7 Plan & Manage. A central graphic titled "Supply Chain Process Life Cycle" illustrates the flow from Sales to Service, with sub-processes like Market & Sell, Design & Develop, Make, Buy, Deliver, and Customer Support. The bottom navigation bar includes links for SCMh Home, About SCMh, Content, What's New, FAQs, Contact Us, Announcements, Take Survey, and IAQG, along with another search bar.



**Introduction: FAQs Updated 19 February 2015**

The 9102 standard is used to standardize the documentation of First Article Inspection (FAI) in aviation, space, and defense. The standard covers processes from manufacturing small electrical components to large structural assemblies. The standard does not cover every instance that may arise within an organization or how the organization is to comply with the requirements. The answers below are to questions about the standard that many organizations have struggled with. While these questions provide guidance, an organization should document their FAI process with interpretations or unique circumstances that apply to the organization. The documented process should be reviewed with customer or flowed down to the suppliers as necessary.

**I1. Question**

What is the value of the FAI process?

**I1. Response**

The value of the First Article Inspection is to validate that the product realization processes are capable of producing parts and assemblies that meet engineering, design requirements.

The Intent of First Article Inspection is to:

- Reduce future escapes, risks, and total costs
- Help ensure safety of flight
- Improve Quality, Delivery, and Customer Satisfaction
- Reduce costs and production delays associated with product non-conformances
- Identify non-capable production realization processes, initiate and validate corrective actions

A well planned and executed FAI will provide objective evidence that the manufacturer's processes can produce compliant product and that they have understood and incorporated requirements.

First Article Inspection (FAI) will:

- Provide confidence that the processes are capable of producing conforming product
- Demonstrate that the manufacturers of the product have an understanding of requirements
- Provide objective evidence of process capability as defined in this standard
- Provide assurance of product conformance at the start of series production and after changes as outlined in this standard.
- Reduce potential risks associated with production startup and process changes

Linkage to other IAQG FAI documents:

**I2. Question**

When should an organization begin the First Article Inspection Process?

**I2. Response**

The Organization should have a process to plan for completion of First Article Inspection, or should plan First Article Inspection activities prior to the First Production Run. FAI planning should address the activities to be performed throughout the First Article Inspection process and the responsible organizations for those activities.

**I3. Question**

What steps are critical to developing a good first article?

**I3. Response**

The organization should consider the following activities during FAI planning, and if required, coordinate planning with customer.

- A. Determination of Design Characteristic inspection and sequencing for inspection of characteristics not measurable in the final product.
- B. Extraction of DPD (Digital Product Design) Characteristics required for product realization that are not fully defined on 2D drawing, from DPD, including tolerances for nominal dimensions.
- C. Determination of objective evidence to be included in the FAIR for each Design Characteristic.

**SCMH Section 3.2.2 First Article  
Inspection 9102B Updated FAQs  
Page 2**

Revision Date: 19-FEB-2015

[www.iaqg.org/scmh](http://www.iaqg.org/scmh) Section 3.2



- D. Determination that approved Special Process, laboratory, material sources, and customer required sources are identified (as applicable), and that the manufacturing planning, routing and purchasing document calls out the correct specification and sources.
- E. Determination that Key Characteristic and Critical Item requirements are identified, as applicable (see International Aerospace Standards 9103 or 9100 for guidance).
- F. Determination when part specific gages and tooling are required, they are identified, qualified and traceable, as applicable.
- G. Provide for customer FAI review, if required.
- H. Events requiring an updated FAI

**I4. Question**

The current revision of 9102 does address Digital Product Designs. How is an organization expected to complete FAI if there is no traditional 2D drawing?

**I4. Response:**

When design requirements are in a DPD format and traditional 2D drawing information is not available for all applicable design requirements, DPD design characteristics required for product realization should be extracted, verified, and included in the First Article Inspection Report. To complete the FAI the organization should:

- Establish a process to extract the applicable DPD design characteristics.
- Extract the DPD design characteristics required for product realization. The characteristics required to actually manufacture the product must also be inspected, all dimensional characteristics or feature definitions.
- Ensure the production, inspection, and operations requiring verification have been completed as planned to achieve DPD design characteristics.

**I5. Question:**

Does the IAQG have additional FAI support materials?

**I5. Response:**

Examples can be found in chapter 3.2 of the SCMHandbook (Supply Chain Management Handbook). The SCMHandbook is posted on the IAQG website. The URL is: <http://www.sae.org/iaqg/handbook/scmhtermsfuse.htm>

**A. Forms Usage**

**A1. Question:**

Are requirements defined as "CR" in the forms (1-3) to be filled only when there is a special requirement from the customer or, always filled when applicable?

**A1. Response:**

"Special requirement from the customer" is only an example of Conditionally Required (CR) items must be filled in when "applicable". For example, not all parts have a serial number but when they do you must fill in that field (form 1 field 3). The same is true for the other "CR" fields. When not applicable or required by engineering, leave them blank or write N/A.

**A2. Question:**

What is the condition upon which form 1, field 4, FAIR Number, is required?

**A2. Answer:**

Field 4 is required when an organization is using a process to produce their FAI that will assign a unique FAIR number to the FAI. This field would not be required when an organization is using paper forms or electronic forms that do not generate a unique FAIR number.

**SCMH Section 3.2.2 First Article  
Inspection 9102B Updated FAQs  
Page 3**

Revision Date: 19-FEB-2015

[www.iagg.org/scmh](http://www.iagg.org/scmh) Section 3.2



**A3. Question:**

What is the difference between field 5 and field 7 on form 1?

**A3. Answer:**

Field 6 of Form 1 is the Drawing Number; this field should have the drawings (including parts list), that contain design characteristics needed for product realization. There may be more than one drawing listed in this field. Field 7 of Form 1 is the Drawing Revision Level, this would be the revision level of the drawing or DPD set that is listed in field 6. When there is more than one entry in field 6 then the entries in this field need to correspond to the entries in field 6.

Field 5 of Form 1 is the Part Revision Level, this is the revision level that is identified on the part. Not all organizations use a part revision level for tracking configuration.

**A4. Question:**

What are some examples of entries for form 1, field 9 (required field)?

**A4. Response:**

The intent is to provide linkage to the planning/router that was used during the manufacture of the FAI part/assembly. Some companies track parts with a production control number and a "router issue number". Production control numbers are usually for cost collection and order tracking and router issue numbers can be directly correlated to the router. You may use anything that provides linkage to the exact router/planning used during FAI.

**A5. Question:**

Form 1 field 9: Manufacturing Process Reference. Please elaborate on what is required?

**A5. Response:**

The purpose of field 9 on form 1 is to provide traceability from the FAI part to the router/planning used to manufacture the part. Any number or reference that provides that traceability is acceptable.

**A6. Question:**

What is the expectation for field 18 when the organization does not have a supplier's FAIR number?

**A6. Answer:**

When an organization does not have the supplier's FAIR number because it does not exist or is not stored to where the organization has access to view the supplier's FAIR when performing their own FAIR, then FAIR number would not be required. When a supplier FAIR number is documented in field 4 of the supplier FAI and the organization has access to view the number when performing the next level FAI then it would be required to be added to the organization's FAI.

**A7. Question:**

Are the forms in the standard examples or are they mandatory?

**A7. Response:**

You may create your own forms but they must require the same information as the forms provided and must be numbered with the same field numbers. See 4.7.1.c..... Forms other than those contained in the Appendix may be used; however they must contain all "Required" and "Conditionally Required" information and have the same field reference numbers.

**A8. Question:**

Can parts lists, reports and other records be noted on the forms and attached rather than copying all the data onto the forms?

**A8. Response:**

Yes, you may reference the attachments on the forms and attach parts lists, reports etc. You may also attach drawings to form 3 and note the drawing on the form as long as the characteristics and results are clearly identified

**SCMH Section 3.2.2 First Article  
Inspection 9102B Updated FAQs  
Page 4**

Revision Date: 19-FEB-2015

[www.iagg.org/scmh](http://www.iagg.org/scmh) Section 3.2



on the drawing. Any efficient, time saving method is acceptable but you must maintain clear traceability and the data on the attachments must be verified.

When automated inspection tooling produces measurement results, those results may be referenced on form 3, identified as pass/fail, and attached when:

- The characteristic numbers on form 3 are clearly linked in the attached report
- The results in the attached reports are clearly traceable to the characteristic numbers on form 3.
- The results are directly comparable to the Design Characteristic. E.g., coordinate data alone would not be acceptable for a positional tolerance; the results should show the actual positional value.

**A9. Question:**

How should multiple pages of forms be numbered?

**A9. Response:**

Each form is to be numbered independent of the others. The reason for three forms is that in some companies, different people or organizations fill out the different forms. It is acceptable to combine them.

**A10. Question:**

Can an electronic signature be used in field 19 of form 1?

**A10. Response:**

An electronic signature is acceptable as long as it is acceptable within your Quality management system. The Quality management system must define electronic signature usage and control.

**A11. Question:**

Form 1 field 14 - What does baseline mean?

**A11. Response:**

This refers to the previous FAI part number, or approved configuration, including revision level, to which a partial FAI is performed. An example of an approved configuration could be a part produced prior to the requirement of this standard.

**A12. Question:**

Can a part produced prior to the application of this standard, be a Baseline Part Number without clear evidence of each design characteristic?

**A12. Response:**

Even if there is no FAIR or detail verification data for each design characteristics (e.g., numerical data), it can be considered a Baseline Part number, as long as the product had already been verified, produced and addressed as conforming product. See Question B9.

**A13. Question:**

Form 2 field 7 - What should be entered in this field?

**A13. Response:**

Field 7 on form 2 is an optional field. Some companies have special codes for different processes and require an entry in this field. If you or your customer has no special code, leave the field blank or mark it N/A.

**A14. Question:**

Form 2 field 8 – Is the supplier name and address required when a supplier code that is adequate for identification is available?

**A14. Response:**

Yes, the supplier name and address would still be required. The first sentence specifies that the supplier name, address, and the supplier code are required to be entered into the field. The requirement from the first sentence is that all three pieces of information are entered into the field. In the second sentence relief is given for the supplier

**SCMH Section 3.2.2 First Article  
Inspection 9102B Updated FAQs  
Page 5**

Revision Date: 19-FEB-2015

[www.iagg.org/scmh](http://www.iagg.org/scmh) Section 3.2



code requirement when the supplier code is not available or not adequate for identification. The supplier name and address are always required, but when the supplier code is not available or adequate, then the supplier name and address may be used in place of the supplier name, address and supplier code.

**A15. Question:**

If using electronic forms and have multiple pages, what fields are required on subsequent pages for each form?

**A15. Response:**

If you are using electronic forms, you can just add rows and additional sheets won't be required. If you are converting the forms to paper and need additional pages, follow the note at the top of the forms instructions: "NOTE: Fields 1-4 are repeated on all forms for convenience and traceability." Repeat fields 1-4 on each additional sheet.

**A16. Question:**

What is the purpose of field 14 on form 3?

**A16. Response:**

Form 3 field 14 is an optional field for the user to add columns and information that are in addition to the requirements of the standard. Since it is optional and at your discretion, you may add columns and titles for those columns as you see fit. You may not rearrange or change any other portion of the form.

**A17. Question:**

What are "characteristic designators" for form 3 field 7?

**A17. Response:**

"Characteristic designators" are identified on engineering documents. Applicable design engineering also establishes definitions of those designators (including major/minor characteristics, key characteristics, structural characteristics, etc.). 9102 cannot provide these definitions.

**A18. Question:**

Where are instructions for filling out the 9102 forms?

**A18. Response:**

Instructions for completing each field in the 9102 forms are contained within 9102. To comply with the standard, you should have an internal procedure defining your method. You can purchase 9102 in many languages from approved publishers like SAE, SJAC & ASD-STAN.

**B. When to Perform an FAI**

**B1. Question:**

When a lapse in production of 2 or more years occurs, is a Full or Partial FAI required?

**B1. Response:**

A FAI is required for any characteristics that may be impacted by the inactivity. When a full FAI is not performed, your FAI procedure should describe the rationale for assessing the characteristics that were not affected by the inactivity and how the assessment is documented.

**B2. Question:**

After an initial FAI is complete, is a supplier required to complete partial FAI's when inspection frequency and methods are changed?

**B2. Response:**

FAI (Complete/Partial) would be required for the changed inspection when the tool listed on Form 3 field 10 is changed.

**SCMH Section 3.2.2 First Article  
Inspection 9102B Updated FAQs  
Page 6**

Revision Date: 19-FEB-2015

[www.iagg.org/scmh](http://www.iagg.org/scmh) Section 3.2



**B3. Question:**

If Manufacturing is moved from one location/facility to another, is a new FAI required?

**B3. Response:**

9102 - 4.6.f.1 states: 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. The key wording is "potentially affect fit, form or function". If you have good rationale supporting a position that the change doesn't "potentially affect fit, form or function" (and you can convince your customer) an updated FAI is not required. The move distance isn't a factor. Record the reason for Partial FAI on field No.14 of Form 1.

**B4. Question:**

In 4.6.f, there are conditions that require a new or partial FAI when a change occurs "that can potentially affect fit, form or function". How is this assessed?

**B4. Response:**

The only people able to evaluate these changes for "fit, form or function" are those knowing the product, the processes, the environment and knowing which problems occurred in the past (lessons learned). These people belong to the producer ("the organization" in 9100). You may also be influenced by your customer. Standards provide requirements but cannot provide methods for meeting the requirements. The organization should have a process to determine who is responsible for addressing events requiring an updated FAI.

**B5. Question:**

Is a partial FAI required for all natural or manmade events that affect the manufacturing process?

**B5. Response:**

The key wording is "that affect the manufacturing process". If a company has provisions, such as calibration or recovery procedures, to validate that the equipment is not affected, then an update is not required.

**B6. Question:**

Can an Assembly FAI be completed when one or more of the detail parts has not completed the FAI process?

**B6. Response:**

Unless the failed detail FAI affects the fit, form or function of the assembly, the Assembly FAI can be completed if it complies with 9102. The failed detail stands on its own, and it alone requires a FAI in accordance with paragraph 4.4.

**B7. Question:**

When engineering provides alternates, must the FAI be repeated when the alternate is used?

**B7. Response:**

A partial or full FAI would generally be required when an alternate is used. The determination of a FAI requirement would depend on your assessment of the potential for affecting fit, form, or function. In cases that determination is made that a FAI is not required, the rationale should be documented.

**B8. Question:**

When the supplier for a process specified by the drawing is changed, must the FAI be redone?

**B8. Response:**

Yes, you or your new supplier must perform a partial FAI covering the processes/characteristics moved. Moving to a new supplier provides the "Potential" to affect fit, form or function. Also see answer to question B3.

**B9. Question:**

If a baseline FAI exists but is to a system used prior to 9102, must the baseline FAI be updated to 9102 prior to performing a new partial FAI?



**SCMH Section 3.2.2 First Article  
Inspection 9102B Updated FAQs  
Page 7**

Revision Date: 19-FEB-2015

[www.iaqg.org/scmh](http://www.iaqg.org/scmh) Section 3.2



**B9. Response:**

9102 is not retroactive. A 9102 partial may be completed using the original completed baseline. See question A9.

**B10. Question:**

Is an FAI required for unique single run production orders.

**B10. Response:**

Section 1.3 states, unless contractually required, the standard does not apply to "Unique single run production orders, not intended for ongoing production". Single Run production orders are a one-time run of a product that is not intended for ongoing production, but may be installed on a production unit.

**C. Standard Catalogue and Commercial-Off-The-Shelf (COTS) Items**

**C1. Question:**

Where is Standard Catalogue and Commercial-Off-The-Shelf (COTS) Items entered on the First Article Inspection Report (FAIR)?

**C1. Response:**

Standard Catalogue and Commercial-Off-The-Shelf (COTS) Items, when used as purchased, are entered on form 1. If Standard Catalogue or Commercial-Off-The-Shelf (COTS) Items (e.g., AN, MS fasteners) are modified, then list that Standard Catalogue or Commercial-Off-The-Shelf (COTS) Items on form 2, field 6.

**C2. Question:**

Are COTS and Standard Catalogue Item C of C required with a FAIR, for items recorded on Form 1?

**C2. Answer:**

The standard requires that non-modified Standard Catalogue Items and Commercial-Off-The-Shelf items are listed on form 1 of the FAI. Field 18 is for the FAIR number and does not require the CofC number to be recorded in this field. Since no CofC number is required to be documented on form 1 of the FAI, the CofC would not be required for supporting documentation.

**C3. Question:**

How is Standard Catalogue Items defined?

**C3. Response:**

Any item purchased from a catalogue available to the public is considered a Standard Catalogue Items. 9102 defines Standard Catalogue Items as: A part or material that conforms to an established industry or national authority published specification, having all characteristics identified by text description or industry/national/military standard drawing.

**C4. Question:**

What is the definition of a Modified Commercial-Off-the-Shelf Item? Can it be a COTS item that is changed in manufacturing or is it a COTS item that is purchased and changed?

**C4. Answer:**

A modified COTS item would be a COTS item that has a change made to it from its originally purchased configuration. An item that has the configuration changed during the manufacturing process would be a "similar part".

**C5. Question:**

Are company designed standards, like Boeing's BAC standards, considered Standard Catalogue Items?

**C5. Response:**

No. Company designed standards are not available to the public and do not meet the definition. Parts manufactured to company designed standards are entered on form 1. (See answer to Question C1).



#### **D. Similar Parts**

**D1. Question:**

Paragraph 4.6 states in part - FAI requirements may be satisfied by previously approved FAI performed on identical characteristics of similar parts produced by identical means. How similar do the parts have to be?

**D1. Response:**

If a series of parts are made using the same processes and the parts are identical except for a few characteristics, a complete FAI can be done on one part and for the others, account for the unique characteristics. On form 3 for the "other parts", record the unique characteristics and refer back to the full FAI for the identical characteristics. The key is traceability and that all characteristics are accounted for.

#### **E. Purchase Order Requirements**

**E1. Question:**

Does 9102 allow inspection to Purchase Order requirements?

**E1. Response:**

Yes. The 9102 definition of drawing requirements indicates that the requirement may be invoked by purchasing document. 9102 definitions: "DRAWING REQUIREMENTS: "Requirements of the drawing and associated parts lists, specification, or purchasing document to which the product is to be produced from, including any notes, specifications, and lower-level drawings invoked.." Use Form 1, field 8 to list the Additional Changes. The Additional Changes in the Purchase Order including added and deleted characteristics are to be reported in Form 3. (e.g. omit fasteners, excess material)

#### **F. General Questions**

**F1. Question:**

Are 9100 requirements duplicated in 9102?

**F1. Response:**

9102 requirements are not intended to duplicate 9100 requirements or test 9100 compliance. Each is a standalone standard.

**F2. Question:**

What is the relationship between 9102 paragraph 4.6 and 9100 paragraph 7.5.1.1?

**F2. Response:**

9102 is one means of meeting 7.5.1.1 but is not mandated by 9100.

**F3. Question:**

What does "First Production Run" mean?

**F3. Response:**

The first production run is the first group of one or more parts that are the result of a planned process designed to be used for future production of these same parts. The first production delivery parts require an FAI. Development and prototype parts that are not intended for production use are not considered as part of the first production run.

**F4. Question:**

How is a partial FAI documented?

**F4. Response:**

When performing a partial FAI, use form 1 and only the additional forms required to document the change. Also, reference the original FAI on form 1, field 14. The original forms must never be altered. You may use attachments to any form if more space is needed.

**SCMH Section 3.2.2 First Article  
Inspection 9102B Updated FAQs  
Page 9**

Revision Date: 19-FEB-2015

[www.iaqg.org/scmh](http://www.iaqg.org/scmh) Section 3.2



**F5. Question:**

Can an FAI be completed when a non-conformance exists?

**F5. Response:**

The non-conformance must be corrected and the correction verified and documented on new forms at the next production run before considering the FAI "completed".

The FAI with design characteristic nonconformance(s) is Not Complete. An FAI with noted nonconforming design characteristics should have field 19 signed and noted as "Not Complete"

- When processing a FAIR with documented non-conformances:
- Record the nonconforming design characteristic(s) on form 3.
- Record the nonconformance document reference number on form 3 field 11.

Check the box "FAI Not Complete" on form 1 field 19. Note: this standard does not control disposition of the nonconformance.

The Organization implements corrective actions and performs a partial FAI for all affected characteristics on the next production run after implementation of the corrective action. If the partial FAI does not clear all non-conformances, the FAI is still Not Complete and the requirement to complete the FAI is still in effect. Note: a full FAI may be done in lieu of a partial FAI.

**F6. Question:**

How are unique characteristic numbers established?

**F6. Response:**

Standards provide requirements and cannot provide methods. You may use any technique that provides traceability from the engineering to the FAI report.

**F7. Question:**

Is it a requirement to have a ballooned drawing in the FAI report?

**F7. Answer:**

The ballooned drawing is often used to show verification that "every design characteristic requirement is accounted for, uniquely identified, and has inspection results traceable to each unique identifier." However, there is no requirement in 9102 for a ballooned drawing to be used, so there is no requirement for it to be part of the supporting documentation. Part of the planning process section 4.2.c.3 is the "Determination of objective evidence to be included in the FAIR for each design characteristic." The company's FAI procedure should detail how they are accounting for each design characteristic.

**F8. Question:**

Is N/A required to be entered on fields that do not contain information?

**F8. Answer:**

This needs to be defined in your QMS procedures.

**F9. Question:**

In the definition of First Article Inspection, what is the meaning of independent as used in 9102?

**F9. Answer:**

The person that verifies the characteristic for the First Article cannot be the same person that generated the characteristic. Self-inspection is not permitted (ie. operator self-verification). Also, the equipment used to verify the characteristic needs to be different from the equipment used to produce the characteristic.

**F10. Question:**

What is expected for evidence of characteristics that are not able to be verified in the final product?

44

43

**SCMH Section 3.2.2 First Article  
Inspection 9102B Updated FAQs  
Page 10**

Revision Date: 19-FEB-2015

[www.iaqg.org/scmh](http://www.iaqg.org/scmh) Section 3.2



**F10. Answer:**

Characteristics not measurable in the final product shall be verified during the manufacturing process, as long as they are not affected by subsequent operations, or by destructive means. Characteristics verified at the detail level may be referenced in the assembly-level FAIR. Your FAI process should address objective evidence to be included in the FAIR for each design characteristic.

**F11. Question:**

Does "Reference Characteristic" (as defined in 9102) include both, "Basic" dimensions and "Reference" dimensions (as defined in ASME Y14.5-2009)?

**F11. Answer:**

The 9102 definition of Reference Characteristic is; "The characteristics that are used for information only" or to show relationship. These are dimensions without tolerances and refer to other dimensions on the drawing." Both basic and reference dimensions fall under the definition of reference characteristics.

To access additional First Article Inspection FAI guidance go to [www.iaqg.org/scmh](http://www.iaqg.org/scmh) accept the terms and conditions for the free guidance and proceed to section 3.2.