

AS9102 First Article Inspection

Many organizations in the aerospace and defense industry require a **First Article Inspection Report (FAIR)**. The purpose of the First Article Inspection is to provide objective evidence that all engineering design and specification requirements are properly understood, accounted for, verified, and documented.

The AS9102A Standard establishes documentation requirements for the First Article Inspection (FAI). The purpose of this standard is to provide a consistent documentation requirement for aerospace components First Article Inspection. Some customers also flowed down the AS9102A requirements to non-aerospace parts as well.

It is intended that the documentation generated on the first article inspection will be a quality record of the supplier and the customer for review of accountability and planning, for performing periodic surveillance and audits to verify conformance, for evaluating root cause and corrective action for any non-conformances, and for problem investigations. Hence, the completeness and accuracy of the record is critical.

Hints for completing the AS9102A form:

Please note these hints are intended as supplemental information to the guidelines published in the AS9102 Standard. This tip sheet should be used in conjunction with the Standard. Since not all parts have the same attributes and characteristics, the hints contained herein are general in nature. The requirements cited in the Standard and/or Protection Technology Group always takes precedent. Some of the requirements are flowed down from our customers, so it is not uncommon to have similar parts with slightly different requirements on the FAIR.

The AS9102A First Article Inspection Report comprises of three forms. Use all three forms to document the results of the First Article Inspection. Additional sheets should be used as needed.

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

AS9102 A 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 the drawing notes.

The input fields on the forms fall into the following categories:

- **Required:** meaning this is mandatory information. It is shown in **Bold** font on the form.
- **Conditionally Required:** meaning this field must be completed when applicable or as required by PTG. It is shown in **Bold Italic** font.
- **Optional:** meaning information is required when available or as specified by PTG. It is shown in Regular font.

The image of the three forms showed on the next page in color provides a quick visual of the three categories. It is not necessary to use the color forms. Actually, photo copies of the color forms are harder to read than plain forms.

- Yellow – Required fields
- Blue – Conditionally required fields
- No color (white) – Optional fields

GENERAL NOTES:

1. Boxes 1 – 4 are repeated on all 3 forms. The entries shall be the same for all 3 forms.
2. Unless being instructed to leave the box blank, insert “N/A” in the box that does not have an entry.
3. Do not use ditto mark or draw a line/arrow down for duplicate entries.
4. The words “our, we, customer, PTG” used in this tip sheet refer to Protection Technology Group.
5. The words “you, yours, supplier” used in this tip sheet refer to the supplier who submits the AS9102A FAI forms.
6. The hints for the entries herein are written with PTG’s requirements/specifications in mind. Your other customers may have a different requirement on how they want their AS9102A FAIR filled out.
7. The AS9102A FAIR needs to be submitted with the first article. Computer printed outs are preferred.

Form 1:

- Box 1. Part Number of the first article part (FAI)
- Box 2 Name of the part as shown on the drawing. Typically, it is the part description in the title block of the drawing.
- Box 3 Serial Number of the FAI. You may or may not have a series number.
- Box 4 Reference number that identifies the FAI. It may be your internal report number.
(Note: Entries in Boxes 1 – 4 on Form 1 are repeated on all 3 forms.)
- Box 5 The revision of the part being first article inspected. The revision level can be found in the title block of the drawing. If there is no revision, indicate as such.
- Box 6 The drawing number associated with the FAI part.
- Box 7 Reference the drawing revision level. Most of time, it is the same as what is in Box 6.
- Box 8 Reference design, Engineering or manufacturing changes affecting the FAI part, not reflected by the current part/drawing revision level. It will be N/A in most cases.
- Box 9 Reference your internal order.
- Box 10 Your company name unless you contracted your FAI to another company. This would be extremely rare.
- Box 11 The supplier number given by PTG. It can be found on the Purchase Order.

- Box 12 Reference the Purchase Order number.
- Box 13 Check one of the two boxes as appropriate.
- Box 14 Check as appropriate. For partial FAI, include the reasons why this is a partial instead of a full FAI. Change of manufacturing location, non-conformance found in the prior Full FAI, & etc. can be some of the reasons.
(Box 15, 16, 17 & 18 are required if the part number in Box 1 is an assembly with lower level parts. Enter "N/A" as appropriate. If entries are necessary, refer to the followings:)
- Box 15 Reference all lower level parts or sub-assembly part numbers.
- Box 16 Part name as shown on the drawing/part list.
- Box 17 Reference the serial number of the part.
- Box 18 A reference number that identifies the FAI package.
- Box 19 The person who prepared the FAI should print his/her name and sign this box.
- Box 20 Date when the FAI was prepared.
- Box 21 The name of the person who reviewed or approved the FAI package (i.e. all 3 forms)
- Box 22 Date when the FAI package was reviewed.
- Box 23 Leave blank for PTG.
- Box 24 Leave blank for PTG.

Form 2

- Box 1 – 4 Entries should be the same as what are in Form 1
- Box 5 Enter the name of the material or process (one per line). E.g. Aluminum, Brass, Electro plating, Painting, Power Coating, Heat Treating, etc.)
- Box 6 Enter the material or process specification number, class and material. E.g. ASTM-B16 BRASS, MIL-STD-G-45204, 7075-T651 Al per ASTM-B211, Cleaning per ASTM-D-2651, etc.
- Box 7 Reference any material code specified.
- Box 8 Reference Special Process Vendor code
- Box 9 Indicate if technical approval is required by the customer.
- Box 10 Reference the report number of the Certificate of Conformance (CoC) or Certificate of Analysis (CoA), Lab report, etc.
- Box 11 Reference the Functional Testing procedure as stated on the drawing.
- Box 12 Reference the Functional Test report number.
- Box 13 Comment as applicable
- Box 14 The name of the person who prepared Form 2. This can be a different person than the one who completed Form 1.
- Box 15 Date when Form 2 is completed.

Form 3

- Depending on the number of characteristics, a second sheet may be needed. Identify and fill in the sheet ___ of ___.
- Due to our customers' requirement/recommendation, Box 14 is now splitted into two columns.

- Box 1 – 4 Entries should be the same as what are in Form 1 and Form 2.
- Box 5 Assign a unique number for each design characteristic. These should match what are on the ballooned drawing. What follows in the next two pages is an example of how the characteristics identified on the drawing are ballooned and their inspection results are documented in Form 3.
- Box 6 Reference the drawing zone. When coordinates such as A-2, D-3 are used to describe the location, use the coordinates otherwise use the sheet number.
- Box 7 Reference any zoned characteristics such as Key Characteristics, Safety Critical Characteristics, etc. otherwise enter "N/A".

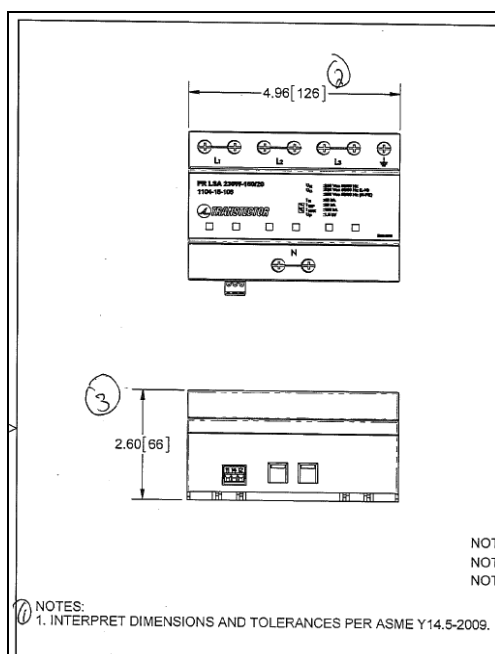
Box 8 Indicate the specified or drawing requirements – dimensional features with the tolerances, drawing notes, specification requirement, etc. In the illustration on the next page, the tolerances are in a summarized format and entered on the bottom line of the form. However, it may be easier to include the tolerance with each individual requirement if the tolerances are not the same for all the requirements. The illustration immediately below shows what the columns for Box 6 to 9 would look like using this alternative format.

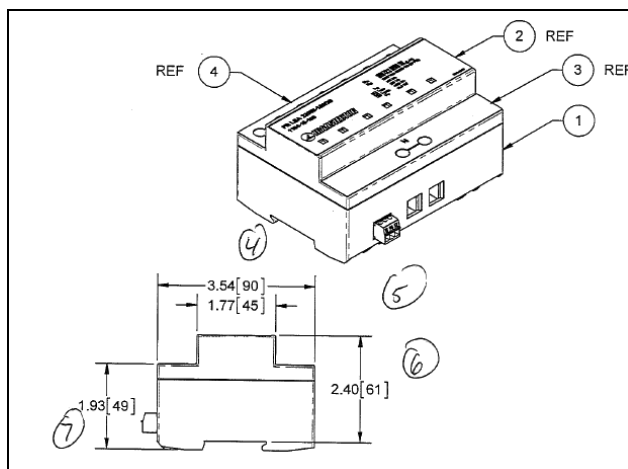
Box 5	Box 6	Box 7	Box 8	Box 9
11	B8	N/A	< 60DEG +/-1DEG	60 DEG
12	B8	N/A	Ø .56" +/- .01	0.565
13	B7	N/A	.130" +.005/-0	0.1325
14	B6	N/A	14.028" +/- .005	14.0247
15	B5	N/A	<45DEG +/-1DEG	45 DEG
16	B5	N/A	.02" +/- .01	0.03
17	B4	N/A	3.10" +/- .01	3.099
18	B3	N/A	Ø .9370" +0/- .0003	0.9368

Box 9 Enter the measurement obtained for each characteristic.

- Multiple characteristics shall be listed as individual values.
- All drawing notes must be accounted for.
- Processes that require design verification must have statement of compliance recorded on the form (i.e. CoA, CoC – state “PASS”, “ACCEPT”, etc.)
- Laboratory reports or Certificate of test must show specific values for the requirements and actual results.

Box 10 Record the tool identification number used for the inspection of that particular characteristic.





Characteristic Accountability				Inspection / Test Results			Inspection Method / Comments	
5: Char No.	6: Reference Location	7: Characteristic Designator	8: Requirement	9: Results	10: Designed Tooling	11: Non-Conformance Number	14: (insert columns, etc. as required by Organization or Customer)	15. Insp. device
								16. Remarks
1	Note 1	N/A	Interpret dimensions and tolerances per ASME Y14.5-2009	Pass	N/A	N/A	N/A	N/A
2	Sht 1	N/A	4.96	Pass / 4.969	6698	N/A	calipers	cal 3/7/11 due 3/7/12
3	Sht 1	N/A	2.60	Pass / 2.602	6698	N/A	calipers	cal 3/7/11 due 3/7/12
4	Sht 1	N/A	3.54	Fail / 3.558	6698	N/A	calipers	cal 3/7/11 due 3/7/12
5	Sht 1	N/A	1.77	Pass / 1.768	6698	N/A	calipers	cal 3/7/11 due 3/7/12
6	Sht 1	N/A	2.40	Pass / 2.40	6698	N/A	calipers	cal 3/7/11 due 3/7/12
7	Sht 1	N/A	1.93	Pass / 1.939	6698	N/A	calipers	cal 3/7/11 due 3/7/12
Tolerances: Fractions + +/- 1/32, Angles = +/- 1°, .XX +/- .01, .XXX .005								
The signature indicates that all characteristics are accounted for; meet drawing requirements or are properly documented for disposition.								

Box 11 Record non-conformance document reference number found with the previous first article (i.e. if the current FAI is a partial FAI).

Box 12 The name of the person who prepared Form 3. This can be a different person than the person who completed Form 1 or Form 2).

Box 13 Date when Form 3 is completed

Box 14 (PTG has splitted this into two columns.)

Box 15 Describe Inspection, Measuring & Test Equipment used for first article inspection (dial bore gage, indicator micrometer, etc.).

Box 16 Enter the cal/cert date of the inspection tools

Most Common Reasons for FAIR Rejection

- C of Cs do not accompany the FAIR
- Missing FAI Reports or Test Reports for sub-assemblies and/or fabricated detail parts.
- Variable data requirements from the engineering drawing are not provided with numerical results.
- Missing or incorrect information provided.
- Missing special processor full address on AS9102 A Form 2, box 8.
- Missing tolerances on AS9102 A Form 3, box 8.
- Customer flow down requirements not met.