Supplier FAIR Work Instruction

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1 Purpose & Scope

This work instruction defines mandatory requirements for suppliers preparing, documenting, and submitting a compliant First Article Inspection Report (FAIR) per **SAE AS9102 Rev C**. Compliance is mandatory for:

- First-time production runs of new parts or assemblies.
- Lapses in production exceeding 24 months (or customer-specified threshold).
- Design, tooling, material, or facility changes requiring a full or partial (delta) FAIR.

2 General Requirements & Rules

- **Bubble / Balloon Drawing:** Every requirement on the engineering definition (drawing, notes, specifications, model-based definition) must receive a unique sequential balloon number.
- **Traceability:** Raw material, special processes, functional test reports, and sub-tier FAI records must trace directly to production heat/lot/serial numbers.
- **Disposition of Nonconformances:** A FAIR cannot be submitted with open or unapproved nonconformances. Discrepant characteristics must reference an approved Nonconformance Report (NCR) or concession number.
- **Rev C Updates:** AS9102 Rev C emphasizes Digital Product Definition (DPD / MBD), updated field naming, clarified partial FAI baseline rules, and enhanced traceability for sub-tier special processors.

3 When is a First Article Required

- The part is being introduced into production for the first time as a result of a new product development.
- The part is being sourced from a new supplier (or new sub-tier supplier).
- The part manufacturing location has changed.
- In the judgment of Sagetech Engineering or Quality; changes have been made to the manufacturing process/work instructions that could affect product conformance.
- The part has been released to a new revision level.
- As requested at the discretion of the Sagetech Quality.
- Whenever there has been a gap in production of 2 or more years.

Reference AS9102C, section 4.6 for full list of when a FAI is required.

4 Execution Sequence

4.1 Determine FAI Scope and Trigger

Evaluate drawing revisions, tooling changes, manufacturing site transfers, or elapsed time.

- Full FAI: New part number, manufacturing location move, or a break in production greater than two years.
- Partial (Delta) FAI: Engineering change order (ECO), tooling change, Nonconformance (NC), or program modification. Explicitly reference the baseline FAI number and revision in Form 1, Field 14.

4.2 Generate the Ballooned/Bubbled Engineering Definition

Identify and assign an index number to every design characteristic across all media:

- Dimensional features, tolerances, and geometric tolerances (GD&T).
- General drawing notes, flag notes, and title block tolerances.
- Material specifications, surface finishes, and coating requirements.
- Model-Based Definition (MBD) or 3D annotations extracted using validated DPD software.

Note: Reference Appendix E for more information.

4.3 Produce Part Under Standard Production Conditions

The FAI unit must be manufactured using regular production tooling, validated NC programs, standard operating procedures, and qualified personnel. Document the specific serial number or shop order/traveler number used.

4.4 Complete Form 1: Part Number Accountability

Document high-level assembly and detail traceability:

- **Fields 1-4:** Part Number, Part Name, Serial Number/Batch, and FAI Report Number.
- **Fields 5-8:** Drawing Number, Revision, Engineering Change Notice (ECN), and Organization Name.
- **Fields 9-13:** Manufacturing Process Reference (Router/Traveler ID), Organization Name, Supplier Code, Purchase Order Number, and Detail or Assembly.
- **Field 14:** Full or Partial FAI, Baseline Part Number (if Partial FAI), and Reason for Partial FAI.
- **Fields 15-18:** Index of Details or Sub-Assemblies to make the FAI Assembly.
- **Field 19:** FAIR Nonconformances.
- **Fields 20-25:** Signature, date, and customer disposition blocks.

4.5 Complete Form 2: Product Accountability

Record raw material, special processes, and functional testing:

- **Material Verification:** Enter specification number, alloy/temper, mill certification number, and raw material heat/lot number.
- **Special Processes:** List all finishing operations (e.g., anodize, heat treat, passivate, NDT). Record processor name, Nadcap accreditation status, customer approval code, and certification tracking numbers.
- **Functional Test Procedures:** Identify standard operational test procedures, test report IDs, and acceptance outcomes.
- Attach copies of all certified material reports (CMTR) and special process certs to Form 2.

4.6 Complete Form 3: Characteristic Accountability

Log inspection results for every ballooned characteristic:

- **Char No. & Location:** Balloon/Bubble reference and drawing sheet/zone coordinates.
- **Characteristic Designator:** Highlight Key Characteristics (KC), critical/major safety features, or flight safety items.
- **Requirement:** Exact nominal value and lower/upper tolerances (or text of note).
- **Results:** Actual measured quantitative values. *Note*: “Pass/Fail” is acceptable only for true attribute gages (e.g., go/no-go thread plug). “Noted” may only be used when acknowledging a note that cannot be measured through attribute or variable measurement methods.
- **Measurement Tooling:** Record the unique equipment ID and calibration due date for every tool used.
- **Nonconformance Info:** If an actual value falls out of tolerance, record the Nonconformance Report (NCR) tracking ID.

4.7 Assemble Package and Submit for Quality Approval

Compile the deliverable in sequence:

- Sign and date Form 1 Fields 20-23 and submit the FAIR package to Sagetech quality in PDF format through the provided secure file portal, prior to lot shipment.

5 What to Include in the FAIR Package

- AS9102 Forms 1-3 (Always include)
- Ballooned/Bubbled Drawing (Always include)
- COC of Finished Product (Always include)
- Packing Slip w/ Part number & Lot (Always include)
- Detail and Subassembly FAIRs (Always Include)

- Material Certifications (Always Include)
- Special Process Certs (When applicable; typically, painted parts)
- COC of sub-components (When applicable)
- PCB test coupon report (When applicable)
- Test report documentation (When applicable)
- Control Plan (When applicable; when KC is called out on drawing)
- Sagetech Approved Standard Deviation Request (When applicable)

Notes:

- When creating FAIR packages, it is recommended to use a software solution such as DISCUS, QA-CAD, or InspectionXpert.
- Verify drawing notes to make sure processes and requirements are followed and documented.
- All FAIs submitted should be a single Adobe type PDF uploaded to the Sagetech Vault. Access to this secure portal will be set up by Sagetech Purchasing.
- FAI part tagged so it can be identified upon receipt at Sagetech. You can also indicate FAI on the packing slip (not in fine print) and on the package.
- For additional details on special process please contact Sagetech Quality.

6 Common Rejection Modes to Avoid

- **Qualitative values for variable dimensions:** Entering "Conforms" instead of actual numeric measurements for dimensional features.
- **Missing drawing notes:** Omitting general notes, edge break specifications, or standard marking callouts from Form 3.
- **Unapproved special processors:** Utilizing chemical processors or NDT houses not listed on the customer's Approved Suppliers List (ASL).
- **Missing calibration data:** Failing to identify the specific gage serial number and calibration status used for inspection on Form 3.
- **Unresolved discrepancies:** Submitting a package with out-of-tolerance results without an accompanying, customer-approved disposition.

7 References

- AS9102 Standard may be purchased at https://www.sae.org/standards
- AS9102 Forms 1-3 are available at no cost https://iaqg.org/standards/forms/

8 Appendices

8.1 Appendix A: AS9102 Form 1

1. Part Number: Sagetech Part Number as listed on PO	**2. Part Name:** Sagetech Part Name as listed within Title Block of Print.	***3. Serial Number:*** Serial Number when required, or Lot/Date Code.	**4. FAIR Identifier:** Unique supplier referernce number that identifies the report for traceability
5. Part Revision Level: Sagetech Part Revision as listed on PO.	***6. Drawing Number:*** Sagetech Drawing Number	***7. Drawing Revision Level:*** Sagetech Drawing Revision	***8. Additional Changes:*** Ref. Deviation Request Number if applicable.
9. Manufacturing Process Reference: Work order/Router Number	**10. Organization Name:** Name of company who built/assembled part	11. Supplier Code: Cage Code; If no CC enter Supplier # from ERP	12. Purchase Order Number: Number of the PO used to procure the parts
13. Detail: ☐ From raw matl. build **Assembly:** ☐ From detail build	**14. Full FAI:** ☐ **Partial FAI:** ☐ Indicate if Full or Partial FAI **Baseline Part Number (including revision level):** If partial FAIR base line part number and the revision level must be listed **Reason for Full / Partial FAI:** Reason for must be written; Full (e.g., New PN, lapse in production) Partial (e.g., new revision)		
a) If the part number above is a detail part only, go to field 19. b) If the part number above 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 Type:***	***18. FAIR Identifier:***
Sagetech part number as listed on DWG BOM	Sagetech part name as listed within title block of print	Detail, Assembly, Software, COTS.	Parts with FAIRs must have their identifier listed here. Can be used to record Lot or Date Code if COTS.
	Blocks 15-18 only get filled out when the FAIR is an assembly. All BOM items go here. Note: If raw material does not have a Sagetech part number it goes on FORM 2. (e.g., 6065-T6 aluminum or adhesive goes on form 2)		

19. Does FAIR Contain a Documented Nonconformance(s)? *Yes* ☐ *No* ☐ If there are nonconformances yes must be selected	
20. FAIR Verified By: Signature of the person creating the FAIR	21. Date:
22. FAIR Reviewed/Approved By: Signature of the person reviewing. Can't be the same as the person who created.	23. Date:

24. Customer Approval: Sagetech will sign off this section once our review is complete.	*25. Date:*
26. Comments: Enter any processes supplier asked not to perform (e.g., Less paint per PO)	

8.2 Appendix B: AS9102 FORM 2

1. Part Number:	2. Part Name:		3. Serial Number:		4. FAIR Identifier:
Ref. Form 1	Ref. Form 1		Ref. Form 1		Ref. Form 1
5. Material or Process Name:	*6. Specification Number:*	7. Code:	*8. Supplier:*	*9. Customer Approval Verification:*	*10. Certificate of Conformance Number:*
Enter full name of material (raw materials, paint, primer, adhusives) or special processes.	Enter material or process specification #.	Any code specified for the matl. or process. (Typically not used)	Name and address of supplier providing material or special process (internal or external).	When required by PO or Statement of Work.	Applicable cert.# or COC#. IF COC doesn't have a number state "Reference attached COC". An invoice number may be used in place of a COC#.

All raw materials or their approved alternatives are to be listed on form 2. Any special processes should also be listed on form 2.

11. Functional Test Procedure Number:	*12. Acceptance Report Number:*
Functional Test Procedure number identified as a design characteristic.	The functional test certification indicating that test requirements have been met.
13. Comments Can be used by the supplier if there is any additional information.	

Results and reports from functional tests should be included in the FAIR package

8.3 Appendix C: FORM 3

1. Part Number Ref. Form 1				2. Part Name Ref. Form 1			3. *Serial Number* Ref. Form 1	4. FAIR Identifier Ref. Form 1
Characteristic Accountability				Inspection / Test Results				
5. Char. No.	*6. Reference Location*	*7. Characteristic Designator*	8. Requirement	9. Results	*10. Designed / Qualified Tooling*	*11. Nonconformance Number*	12. Additional Data / Comments	
Number from balloon drawing	Location / coordinates on the print of Char. Must include sheet and zone (e.g., Sheet 1, Zone B4)	Unique identifier for Key Char. (KC), default term for non-KCs is Minor.	Specific requirment on the print. Must match the design Char. exactly. No paraphrasing.	Measured result. Ref. appendix D for further guidance.	Tool used for measurement . Include Tool ID# and calibration due date. May also enter visual or N/A.	Include Nonconformance Report Number if applicable. Enter N/A if no NC.	Additional comments or enter N/A.	

8.4 Appendix D: Additional Information on the Results Section

- List measurement(s) obtained for the design characteristics.
- Record the results in the units (e.g., metric, imperial systems) specified on the drawing, DPD, unless otherwise approved by Sagetech.
    - 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, record the results as an attribute (e.g., pass/fail).
- When automated inspection equipment produces measurement results, those results may be referenced on Form 3 identified as pass/fail and attached only when:
    - The characteristic numbers are clearly linked in the attached report [e.g., characteristic identification on Coordinate Measurement System (CMS) report is the same as on this form].
    - The results in the attached reports are clearly traceable to the characteristic numbers.
    - The results are directly comparable to the design characteristic.

- A CMS report only depicting deviation from nominal in multiple axes is not acceptable; the report shall reflect an actual measured geometric value.
- 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 form. 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/master samples/standards; list the unique identifier 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).

8.5 Appendix E: Ballooned/Bubbled Drawings

A bubble is a circled or boxed character that is used to identify the location of a requirement definition and is used to identify the inspection or measurement of the definition on the Characteristic Results Form (Form 3).

Notes:

- It is not a requirement to start with the notes but is the best practice.
- All notes and instructions need to be bubbled.
- Reference and basic dimensions do not need to be bubbled
- All specification definition is to be bubbled
- When a Characteristic has multiple spots where the dimension applies either all results need to be provided or the range (low-high).
- For a single characteristic with multiple dimensioned features (e.g., Hole w/ counterbore & counterbore depth) results should be ballooned using the numbering 3, 3.1, 3.2.
- Ballooning a Specification may be clarified by Sagetech quality representative.

9 Version History

Ver.	Summary of Changes	Effective	Approved by
1.0	Initial Release	OCT 2026	DCR00214