

TE Requirement – Frist Article Inspection

AS9102 Rev B – Aerospace First Article Inspection Requirement

Invoked by AS9100:

8.5.1.3 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 able to produce parts and assemblies that meet requirements. This activity shall be repeated when changes occur that invalidate the original results (e.g. engineering changes, production process changes, tooling changes).

NOTE: This activity can be referred to as First Article Inspection (FAI).

Definition

First Article Inspection (FAI):

[Also referred to as Production Process Verification] 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.

NOTE: This activity can be referred to as First Article Inspection (FAI).

NOTE: See (AS) (EN) (SJAC) 9102 Rev B for guidance.

TE Requirement – Frist Article Inspection

TEC 1005 - REQUIREMENTS FOR SUPPLIERS

6.11. Inspection

- A. When indicated on the purchase order or other appropriate document when applicable, **first article** inspection data approval shall be obtained from the supplier and approved by TE prior to initiation of full production. The supplier is responsible for notifying Purchasing when **first article** samples and inspection data are available. Purchasing will make arrangements with the supplier to review the **first article** data and samples. TE **first article** approval does not relieve the supplier of the responsibility of assuring that subsequent production is in accordance with documented requirements.

For product manufactured to TE specifications a **First Article** Inspection Report (FAIR) may be required.

FAI approval must be granted by TE before shipment of product and in accordance with the latest revision level of AS9102 Aerospace **First Article** Inspection Requirement. When directed by TE, Supplier shall document FAIs within the licensed Net-Inspect software.

Partial or Re-accomplishment of a **First Article** Inspection shall also be done in accordance with the latest revision level of AS9102 Aerospace **First Article** Inspection Requirement, section 5.3.

First article data must include verification of materials and all specifications and tolerances on the prints, the actual reading of each dimension, a numbered print to correlate to the recorded data and

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must include the print revision level. Where physical testing is required, test results must also be documented on the FAIR. If the FAI sample is accepted, the remainder of the lot will be inspected in accordance with the supplier's final inspection plan.

All out of tolerance conditions will be listed and corrected or reported to TE Quality Assurance prior to delivery of the supplies.

Suppliers shall conduct periodic **First Article** Inspection for Aerospace Products. Tooling shall be approved and periodically verified through FAI. Tools out of service shall be properly stored and periodically checked.

When specified on the purchase order all products shipped to TE Aerospace sites shall be accompanied by a certificate of compliance (C of C) stating that the materials provided conform to the order requirements. This C of C shall include the TE part number and revision level, purchase order number, quantity of parts in the shipment, date and the release authority's signature or stamp. Material analysis reports should accompany all raw material or contact material shipments. Supplier shall supply current Material Safety Data Sheets (MSDS) for raw materials and chemical compounds. Shipments not accompanied by the required documentation are subject to rejection.

102-32067 - Supplier First Article Inspection

102-32029 – ADM Quality Supplier



Purpose

FAIs provide objective evidence that:

All engineering design, specification requirements and manufacturing processes are:

- Understood
- Accounted for
- Verified
- Capable (SPC)
- Documented

What documents should be included in a First Article Inspection Report (FAIR)?

Requirements should be included in FAIR

- ✓ AS 9102 forms 1/2/3
- ✓ Balloon Drawing
- ✓ Material (s) Certificate in accordance with TE technical specification /Test
- ✓ CoC's (Certificates of conformance)
- ✓ Deviation request if there is a Non conformance or a discrepancy
 - Deviation request should be approved by TE before to ship parts.
- ✓ Drawing requirements
 - including any notes , specifications, and lower-level drawings invoked.
- ✓ Control Plan /QIP



When should FAIs be performed?

Full FAI

- Whenever there is a part or product that is being made for the first time
- Whenever there is a new supplier for a raw material in the final product
- When required by the customer
- When there is a change in the product design
- When there is a significant change in the method of manufacture (e.g. **Tooling**, Processes, **Machine**, **Location**, Numerical Control Program, Sequence of Manufacturing, etc.)
- When a product has not been manufactured in 2 years
 - Lapse is calculated from completion of last production operation to actual restart of production

Partial FAI

- Partial FAIs are generally not performed, as Full FAIs can be performed in lieu for circumstances calling for a partial FAI

AS9102(B) Forms and Supporting Information

The following three forms are templates used to meet the documentation requirements of AS9102(B). They report the key information needed to demonstrate that the production processes are compliant to the engineering design and specification requirements. These three forms are assembled with the other required documentation in a packet that will be presented to the customer for review and approval.

- The Total Number of Pages in the Report only counts Forms 1 – 3.
 - e.g. It can be a 30 page report, but Forms 1 – 3 may only be 5 pages.

Non conformances

When dealing with an FAI Sample with nonconforming design characteristics, the following options are available:

1. Request Manufacturing to remake the FAI Sample

- a) Re-examine all design characteristics to ensure conformance on all other characteristics
- b) Prepare a delta (partial) FAI report listing only the previously nonconforming characteristic
- c) Have your Quality Manager or a senior Quality Engineer review the report.
- d) Submit the delta FAI report along with the original full FAI report to the customer for review and approval – retain both samples for traceability

2. Submit a sales call/Request customer deviation for the nonconformance

- a) Paperwork documenting the customer approval must be included with the report
 - a) No paperwork = no approval

AS9102(B) Form 1: Part Number Accountability

AS9102(B) Form 1: Part Number Accountability

This form is used to identify the product that is having the First Article Inspection (FAI) conducted on

- Form 1 also includes all of the related data
 - Part number and revision level
 - Type of manufacturing process
 - Name of organization performing the FAI
 - Type of FAI
 - Detail Part / Assembly
 - Full / Partial

Filling in AS9102 Forms 1-3

AS/EN/SJAC 9102 Rev B First Article Inspection
Form 1: Part Number Accountability

Sheet 1 of 5

| | | | |
|---|---|--|----------------------------------|
| 1. Part Number: TE: EL7875-000 Customer: E-CBL01-22 | 2. Part Name: EPD-RWC-24667C S3457 | 3. Serial Number: NA | 4. FAI Report Number: D450-27 |
| 5. Part Revision Level: NA | 6. Drawing Number: EPD-RWC-24667 | 7. Drawing revision level: A | 8. Additional Changes: NA |
| 9. Manufacturing Process Reference: NA | 10. Organization Name: TE Connectivity Aerospace Defense & Marine | 11. Supplier Code: 06090 | 12. P.O. Number: 721598 |
| 13. Detail FAI <input checked="" type="checkbox"/> | 14. Full FAI <input checked="" type="checkbox"/> Partial FAI <input type="checkbox"/> | Baseline Part Number (including revision level): | |
| Make the assembly noted above. | | | |
| NA | NA | NA | 15. FAIR Number NA |
| 19. Signature Daniel Nguyen <input checked="" type="checkbox"/> FAI complete <input type="checkbox"/> FAI not Complete | | | 20. Date: 10/13/2017 |
| 21. Reviewed By: Michael Annino | | | 22. Date: |
| 23. Customer: | | | |

Form 1, 9102

YELLOW fields – MANDATORY information

**BLUE fields – CONDITIONALLY REQUIRED.
These fields must be completed when
information is available.**

**WHITE fields – OPTIONAL information, required
when available.**

AS9102(B) Form 1: Part Number Accountability

The form is divided into several sections. The top section contains fields 1 through 8, each with a corresponding callout box. Below this is a section for FAI status (Assembly FAI or Partial FAI) and a section for the baseline part number and reason for partial FAI. At the bottom, there are instructions and an index section.

| | | | |
|--|--|--|---|
| 1. Part Number: TE: EL7875-000 Customer: E-CBL01-22 | 2. Part Name: EPD-RWC-24667C S3457 | 3. Serial Number: NA | 4. FAI Report Number: D450-27 |
| 5. Part Revision Level: NA | 6. Drawing Number: EPD-RWC-24667 | 7. Drawing revision level: A | 8. Additional Changes: NA |
| 9. Manufacturing Process Reference: NA | 10. Organization Name: TE Connectivity Aerospace | 11. Supplier Code: 08090 | 12. P.O. Number: 721598 |

Assembly FAI Partial FAI

Baseline Part Number (including revision level):
 Reason for Partial FAI:

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



AS9102(B) Form 1: Part Number Accountability

AS/EN/SJAC 9102 Rev B First Article Inspection
Form 1: Part Number Accountability

Sheet 1 of 5

| | | | |
|---|--|-----------------------------|----------------------------------|
| 1. Part Number: TE: EL7875-000 Part Number: EL7875-000 Revision Level: BL01-22 | 2. Part Name: EPD-RWC-24667C S3457 | 3. Serial Number: NA | 4. FAI Report Number: D450-27 |
| 9. Manufacturing Process Reference: NA | 10. Organization Name: TE Connectivity Aerospace Defense & Marine | 11. Supplier Code: 08090 | 12. P.O. Number: 721598 |
| 13. Detail FAI <input checked="" type="checkbox"/> Assembly FAI <input type="checkbox"/> | 14. Full FAI <input checked="" type="checkbox"/> Partial FAI <input type="checkbox"/> Baseline Part Number (including revision level): Reason for Partial FAI: | | |

Box 9. Internal Process Reference (can list NA)

Box 10. Name of the Organization Preparing FAI

Box 11. Organization Vendor (Cage) Code

Box 12. Customer PO Number

Box 13. Type of FAI (Detail or Assembly)

Box 14. Always a Full FAI



AS9102(B) Form 1: Part Number Accountability

| 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. FAIR Number |
| NA | NA | NA | NA |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

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

Box 16. Part name as shown on drawings/parts list


Box 17. Serial Number of the Part

Box 18. FAIR Number of Sub-Assembly (Can be C of C and/or Packing Slip) – Must include C of C's with Report

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.

| | |
|------------------------------------|-----------|
| 21. Reviewed By: Michael Annino | 22. Date: |
| 23. Customer Approval: | 24. Date: |

Form 1, 9102 Rev B, Date: Oct, 2014





AS9102(B) Form 2: Product Accountability

AS9102(B) Form 2: Product Accountability – Raw Material, Special Processes, and Functional Testing

This form is used to document the raw materials, special processes and functional testing used in the manufacturing of the product. In addition, the below information is also listed:

- Material or Special Process Name (Typically the part number is used for raw material)
- Specification Number
- Supplier (Typically the Vendor 4-Digit/6-Digit SAP Code is used)
- Certificate of Conformance or Test Report Number

AS9102(B) Form 2: Product Accountability

AS/EN/SJAC 9102 Rev B First Article Inspection
 Form 2: Product Accountability – Raw Material, Specifications and Special Process(es),
 Functional Testing

Sheet 2 of 5

| 1. Part Number: | 2. Part Name: | | 3. Serial Number: | | 4. FAI Report Number: |
|--|--------------------------|----------|-------------------|------------------------------------|--|
| TE: EL7875-000 Customer: E-CBL01-22 | EPD-RWC-247667 S3457 | | NA | | D450-27 |
| 5. Material or Process Name: | 6. Specification Number: | 7. Code: | 8. Supplier: | 9. Customer Approval Verification: | 10. Certificate of Conformance number: |
| 705773-1 | WCPS 3017/103 Rev B | NA | 349083 | NA | 484256 |
| CC9892 | | | | | AI00039012 |
| EL8915 | | | | | 1847768-1 |
| EL6188 | | | | | 279094 |
| CU7230 | | | | | 342815 |
| CA6170-000 | WCPS 3017/77 Rev. C | NA | 349083 | NA | 485196 |
| CV0265-000 | SPI-485 | NA | 4520 | NA | 1846248-15 |
| CV0265-000 | SPI-485 | NA | 4520 | NA | 1846248-16 |
| | | | | | |
| | | | | | |
| | | | | | |

Boxes 1 – 4 are repeated on all forms for convenience and traceability



AS9102(B) Form 2: Product Accountability

AS/EN/SJAC 9102 Rev B First Article Inspection Form 2: Product Accountability - Material, Process

Sheet 2 of 5

Function: _____

1. Part Number: TE: EL7875-000 Customer: E-CBL01-22

| 5. Material or Process Name: | 6. Specification Number: | 7. Code: | 8. Supplier: | 9. Customer Approval Verification: | 10. Certificate of Conformance number: |
|------------------------------|--------------------------|----------|--------------|------------------------------------|--|
| 705773-1 | WCPS 3017/103 Rev B | NA | 349083 | NA | 484256 |
| CC9892-000 | PS-1651 Rev C | NA | 314021 | NA | AI00039012 |
| EL8915-000 | SPI-CC912 | NA | 4520 | NA | 1847768-1 |
| EL6188-000 | WCPS T-062/1 | NA | 314287 | NA | 279094 |
| CU7230-000 | 55A0114 22 0 WCP | NA | 06000 | NA | 010015 |
| | WCPS | | 349 | | |
| | | | 45 | | |
| | | | 4520 | NA | 1040240-10 |

Box 5. Name of the Material (Raw Material) or Special Process

Box 6. Raw Material or Special Process Specification Number

Box 7. Reference any Material Code Specified (can list NA)

Box 8. Reference Supplier Vendor Code

Box 9. Indicate if Technical Approval is required by the Customer (can list NA)

Box 10. Reference Certificate of Conformance Number, Test Report Number of Raw Material or Special Process

AS9102(B) Form 2: Product Accountability


| | | | |
|--|--|--|--|
| <p>Box 11. Functional Test Procedure Number (Purchase Specs/Manufacturing Specs are already listed in Column 6)</p> | | <p>Box 12. Acceptance Report Number (if applicable, can list NA since C of C's and Test Report #'s are already listed in column 10)</p> | |
| <p>11. Functional Test Procedure Number</p> <p>See Applicable Specs / Procedures in column 6</p> | <p>12. Acceptance Report Number:</p> <p>NA</p> | | |
| <p>13. Comments</p> <p>None</p> | | | |
| <p>14. Signature:</p> <p>Daniel Nguyen</p> | | <p>15. Date:</p> <p>10/13/2017</p> | |

Form 2, 9102 Rev B, Date: Oct, 2014

Box 13. Comments, as applicable

Box 14. Name of the Person who prepared this form, Must have formal documented training.

Box 15. Date when the form was completed




AS9102(B) Form 3: Characteristic Accountability

AS9102(B) Form 3: Characteristic Accountability, Verification, and Compatibility Evaluation

This form is used to record inspection results for the design characteristics and any functional tests that need to be performed per the Manufacturing Spec, SCD or CSR. In addition, the type of equipment or tool used in the validation of each characteristic is documented.

- The asset number used to validate the characteristic must be listed for traceability.
- Some large OEM customers require the calibration due date for the test equipment/tooling.
- This form may – and usually – contains more than 1 page.

AS9102(B) Form 3: Characteristic Accountability

**AS/EN/SJAC9102 Rev B First Article Inspection
Form 3: Characteristic Accountability, Verification and Compatibility Evaluation**

Sheet 3 of 5

| 1. Part Number: TE: EL7875-000 / Customer: E-CBL01-22 | | 2. Part Name: EPD-RWC-24667C S3457 | | 3. Serial Number: NA | | 4. FAI Report Number: D450-27 | |
|--|-----------------------|---------------------------------------|---|---------------------------|----------------------------------|----------------------------------|--------------------------------|
| Characteristic Accountability | | | | Inspection / Test Results | | | |
| 5. Char No. | 6. Reference Location | 7. Characteristic Designator | 8. Requirement | 9. Results | 10. Designed / Qualified Tooling | 11. Non-Conformance Number | 14. Additional Data / Comments |
| 1 | SCD | Key | Component Wire - 55A0114-22 | Conform | Visual | NA | NA |
| 2 | SCD | Key | Component Wire Count - 3 Wires | Conform | Visual | NA | NA |
| 3 | SCD | | Component 1 Color | | | NA | NA |
| 4 | SCD | | | | | NA | NA |
| 5 | SCD | | | | | NA | NA |
| 6 | SCD | | | | | NA | NA |
| 7 | SCD | Key | Shield Material Round Nickel Copper High Strength 40 AWG Regular | Conform | Visual | NA | NA |
| 8 | SCD | Key | Jacket Material FEP-LM White | Conform | Visual | NA | NA |
| 9 | SCD | Key | Cable Core OD (inch) 0.092 Nominal | 0.091" | C24766-6 | NA | NA |
| 10 | SCD | Key | Wrap Thickness (inch) 0.002 Nominal | 0.0010" | C24766-6 | NA | NA |
| 11 | SCD | Key | Shield Thickness (inch) 0.007 Nominal | 0.0031" | C24766-6 | NA | NA |
| 12 | SCD / Spec 1200 | Key | Jacket Thickness (inch) 0.015 Nominal | 0.015" / 0.017" | C24766-6 | NA | NA |
| 13 | SCD | Key | Overall Diameter (inch) 0.139 ± 0.007 | 0.138" | C24766-6 | NA | NA |
| 14 | SCD | Key | Weight (lbs/1000 ft.) 18.81 Nominal | 18.88 lbs/kft. | C25183-6 | NA | NA |
| 12. Signature Daniel Nguyen | | | | | | | 13. Date 10/13/2017 |

Boxes 1 – 4 are repeated on all forms for convenience and traceability



AS9102(B) Form 3: Characteristic Accountability

Section Verification and Control
2. Part Number: EPD-RWC
8. Recipient: TTI, Inc.

Sheet 3 of 5

Number: 7
Additional Data / Comments

Box 5. Assign a unique number for each characteristic described in the customer or TE drawing and applicable documents (CSR)

Box 6. Reference the place of origin of the feature (SCD, Specification, CSR, etc.)

Box 7. Designate whether it is a Key or Minor Characteristic

Box 8. Indicate the specified requirement for the characteristic (e.g. dimensional characteristics, minimum and maximum values, visual characteristics)

For TTI, Inc., List all Characteristic Designators as Minor unless otherwise specified

| No. | Location | Designator | Requirement | Conformance | Tooling | Number | Additional Data / Comments |
|-----|--------------------|------------|---|-------------|---------|--------|----------------------------|
| 1 | SCD | Key | Component Wire - 55A0114-22 | Conform | Visual | NA | NA |
| 2 | SCD | Key | Component Wire Count - 3 Wires | Conform | Visual | NA | NA |
| 3 | SCD | Key | Component 1 Color 9 (White Jacket) | Conform | Visual | NA | NA |
| 4 | SCD | Key | Component 2 Color 91 (White Jacket Brown Stripe) | Conform | Visual | NA | NA |
| 5 | SCD | Key | Component 3 Color 90 (White Jacket) | Conform | Visual | NA | NA |
| 6 | SCD | Key | Wire L-PET .001" | Conform | Visual | NA | NA |
| 7 | SCD | Key | Shield Round Nickel Copper | Conform | Visual | NA | NA |
| 8 | SCD | Key | Jacket FEF | Conform | Visual | NA | NA |
| 9 | SCD | Key | Cable 0.0 | Conform | Visual | NA | NA |
| 10 | SCD | Key | Wrap 0.0 | Conform | Visual | NA | NA |
| 11 | SCD | Key | Shield Thickness (inch) 0.007 Nominal | Conform | Visual | NA | NA |
| 12 | SCD / Spec 1200 | Key | Jacket Thickness (inch) 0.015 Nominal | Conform | Visual | NA | NA |
| 13 | SCD | Key | Overall Diameter (inch) 0.139 ± 0.007 | Conform | Visual | NA | NA |
| 14 | SCD | Key | Weight (lbs/1000 ft.) 18.81 Nominal | Conform | Visual | NA | NA |

12. Signature: Daniel Nguyen
13. Date: 10/13/2017

AS9102(B) Form 3: Characteristic Accountability

AS/EN/SJAC9102 Rev B First Article Inspection

Sheet 3 of 5

Report Number: 0450-27

2. Part Name: EPD-RWC-24667CS

3. Characteristic Accountability

| No. | Location | Designator | 8. Requirement | 9. Results | 10. Designed / Qualified Tooling | 11. Non-Conformance Number | 14. Additional Data / Comments |
|------------------------------|----------|------------|---|------------|----------------------------------|----------------------------|--------------------------------|
| 1 | SCD | Key | Component Wire - 55A0114-22 | Conform | Visual | NA | NA |
| 2 | SCD | Key | Component Wire Count - 3 Wires | Conform | Visual | NA | NA |
| | | | Component 1 Color (White Jacket) | Conform | Visual | NA | NA |
| | | | Component 2 Color (White Jacket, Brown Stripe) | Conform | Visual | NA | NA |
| | | | Component 3 Color (White Jacket, Black Stripe) | Conform | Visual | NA | NA |
| | | | Wrap Material (ET .001" AL Facing Out (Blue)) | Conform | Visual | NA | NA |
| | | | Shield Material (Copper High Strength 40 AWG Regular) | Conform | Visual | NA | NA |
| 8 | SCD | Key | Jacket Material (FEP-LM White) | Conform | Visual | NA | NA |
| 9 | SCD | Key | Cable Core OD (inch) (0.092 Nominal) | 0.091" | C24766-6 | NA | NA |
| | | | Wrap T | | | | |
| | | | Shield T | | | | |
| | | | Jacket T | | | | |
| | | | Overall | | 4766-6 | NA | NA |
| | | | Weight | | 5183-6 | NA | NA |
| | | | 18.04 nominal | | | | |
| 12. Signature: Daniel Nguyen | | | | | | | 13. Date: 10/13/2017 |

Box 9. Results of each of the characteristics listed

Box 10. Record the Asset Number of the Qualified Tooling used to validate the characteristic (can be "Visual" for qualitative characteristics)

Box 14. Additional Comments (can be NA)

Box 9. **Never** submit a FAI with results out of conformance, unless the customer has provided a written approval (deviation). The written approval **must** be included with the report.

Box 12. Name and Signature of the person who prepared this form. Must have formal documented training

Box 11. Record non-conformance document reference number if any design characteristic is found non-conforming (can list NA) – See Box 9 about nonconformances

Box 13. Date this form was completed

FAI Sampling, Completion & Submission

The FAI including evidences & documents associated (see slide 5) should be submitted by email to

- Supplier Quality and paper version should be added with parts.

Upon submitting the FAI to the customer:

- Request customer approval for the report and place a customer-signed Form 1 with the hard copy of the FAIR.

International Traffic in Arms Regulations

International Traffic in Arms Regulations (**ITAR**) is a United States regulatory regime to restrict and control the export of defense and military related technologies to safeguard U.S. national security and further U.S. foreign policy objectives.

ITAR Continued...

U.S. Persons, including companies that manufacture components for military applications, can be heavily fined if they do not take measures to safeguard the information related to the manufacture of such products (documentation, drawings, processes, specifications, etc.)

ITAR Continued...

The U.S. Department of State interprets and enforces ITAR. Its objective is to safeguard the national security of the United States and other U.S. foreign policy objectives.

In particular, the ITAR regulations dictate that information and material related to military defense and related technologies can only be shared with authorized persons from the United States, unless they receive authorization from the U.S. Department of State.