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Aerospace series — Quality systems — First article inspection requirements

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee ACE/1, International and European Aerospace Policy and Processes.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 9102

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English Version

Aerospace series - Quality systems - First article inspection requirements

Série aérospatiale - Systèmes qualité - Exigences pour la revue premier article

Luft- und Raumfahrt - Qualitätsmanagement - Erstmusterprüfung Anforderungen

This European Standard was approved by CEN on 27 September 2015.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN 9102:2015) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this European Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2016, and conflicting national standards shall be withdrawn at the latest by June 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 9102:2006.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

RATIONALE

This European Standard was revised to emphasize the value of the First Article Inspection (FAI) process to an organization, separate and enhance the planning and evaluation activities, and define Digital Product Definition (DPD) and its relationship to the FAI process. Additional changes to the standard requirements, definitions, and associated notes were incorporated in response to stakeholder needs.

To assure customer satisfaction, aviation, space, and defence organizations must produce and continually improve safe, reliable products that meet or exceed customer and applicable statutory and regulatory requirements. The globalization of the industry and the resulting diversity of regional and national requirements and expectations have complicated this objective. Organizations face the challenge of purchasing products from suppliers throughout the world and at all levels of the supply chain. Industry suppliers and processors face the challenge of delivering products to multiple customers having varying quality requirements and expectations.

The aviation, space, and defence industry established the International Aerospace Quality Group (IAQG) for the purpose of achieving significant improvements in quality and safety, and reductions in cost throughout the value stream. This organization includes representation from companies in the Americas, Asia/Pacific, and Europe. This international standard has been prepared by the IAQG.

This document standardizes FAI process requirements to the greatest extent possible and can be used at all levels of the supply chain by organizations around the world to provide a consistent process and documentation requirements for verification of aviation, space, and defence product. Its use should result in improved quality, schedule, and cost performance by the reduction or elimination of organization-unique requirements and wider application of good practices. While primarily developed for the aviation, space, and defence industry, this European Standard can also be used in other industry sectors where a standardized FAI process is needed.

1 Scope

1.1 General

This European Standard establishes the baseline requirements for performing and documenting FAI. Should there be a conflict between the requirements of this European Standard and applicable statutory or regulatory requirements, the applicable statutory or regulatory requirements shall take precedence.

1.2 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 start-up and/or process changes.
- Provide assurance of product conformance at the start of production and after changes outlined in this European Standard.

An FAI is intended 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 nonconformances.
- Identify product realization processes that are not capable of producing conforming product, and initiate and/or validate corrective actions.

1.3 Application

This European Standard applies 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 European Standard to suppliers or processors who produce design characteristics.

This European Standard applies to assemblies, sub-assemblies, and detail parts including castings, forgings, and modifications to standard catalogue or Commercial-Off-the-Shelf (COTS) items.

Unless contractually required, this European 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.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 9100, *Quality management systems — Requirements for aviation, space and defence organisations*

EN 9103, *Quality management systems — Variation management of key characteristics*

ISO 9000, *Quality management systems — Fundamentals and vocabulary*

NOTE Equivalent versions (e.g., AS, EN, JISQ, SJAC, NBR) of the IAQG standards listed above are published internationally in each IAQG sector.

3 Terms and definitions

An acronym log for this European Standard is presented in Annex A. For the purposes of this European Standard, the terms and definitions stated in ISO 9000 and the following apply:

3.1
attribute data
a result from a characteristic or property that is appraised only as to whether it does or does not conform to a given requirement (e.g., go/no-go, accept/reject, pass/fail)

3.2
baseline part number
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 requirements of this European Standard.

3.3
capability
ability of an organization, system, or process to produce a product that will fulfill the associated design characteristics defined for that product

3.4
Commercial-Off-the-Shelf (COTS) items
commercially available items intended by design to be procured and utilized without modification (e.g., common electronic components)

3.5
deliverable software
embedded or loadable airborne, space borne, or ground support software or firmware components which are part of an aircraft type design, weapon system, missile, or spacecraft

3.6
design characteristics
those dimensional, visual, functional, mechanical, and material features or properties, which describe and constitute the design of the article, as specified by drawing or DPD requirements. These characteristics can be measured, inspected, tested, or verified to determine conformance to the design requirements. Dimensional features include in-process locating features (e.g., target-machined or forged/cast dimensions on forgings and castings, weld/braze joint preparation necessary for

acceptance of finished joint). Material features or properties may include processing variables and sequences, which are specified by the drawing or DPD (e.g., heat treat temperature, fluorescent penetrant class, ultrasonic scans, sequence of welding and heat treat). These provide assurance of intended characteristics that could not be otherwise defined.

3.7
designed tooling
product specific tooling [e.g., check fixtures, Coordinate Measurement Machine (CMM) program] specifically made to validate the design characteristics of a product

3.8
Digital Product Definition (DPD) requirements
requirements of any digital data files that disclose, directly or by reference, the physical or functional requirements, including data files that disclose the design or acceptance criteria of a product

Examples of DPD include the following:

- The digital definition and fully dimensioned two-dimensional (2D) drawing sheets.
- Three-dimensional (3D) data model and simplified or reduced content 2D drawing sheets.
- The 3D model with design characteristics displayed as text.
- Any other data files that define a product in its entirety.

3.9
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

3.10
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 document

3.11
First Article Inspection Report (FAIR)
the forms and package of documentation for a part number, sub-assembly, or assembly, including associated FAI results, as defined by this European Standard

3.12
first production run
the initial 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

3.13
multiple characteristics
Identical characteristics that occur at more than one location (e.g., “4 places”), but are established by a single set of drawing or DPD requirements (e.g., rivet hole size, dovetail slots, corner radii, chemical milling pocket thickness)

3.14
product
any intended output resulting from the product realization process, which in the context of this European Standard includes finished detailed parts, sub-assemblies, assemblies, forgings, and castings

3.15
qualified tooling
universal (not part specific) calibrated monitoring and measuring equipment (e.g., go/no go gauges, thread gauges, radius gauges) used to validate product design characteristics, that are uniquely identified and traceable to their calibration records

3.16
reference characteristics
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 or in the DPD

3.17
special processes
any processes for production and service provision where the resulting output cannot be verified by subsequent monitoring or measurement and, as a consequence, deficiencies become apparent only after the product is in use or the service has been delivered

3.18
standard catalogue items
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

3.19
variable data
quantitative measurements taken on a continuous scale (e.g., the diameter of a cylinder, the gap between mating parts)

4 Requirements

4.1 Part requirements

a) The organization shall perform FAI on new product representative of the first production run. The first production delivery parts require an FAI.

b) The organization shall use a representative item from the first production run of a new product to verify that the production processes, production documentation, and tooling have the capability to produce products that meet established requirements.

c) For assemblies, the assembly level FAI shall be performed on those characteristics specified on the assembly drawing or DPD.

d) This process shall be repeated, when changes occur that invalidate the original results (e.g., engineering changes, manufacturing process changes, tooling changes).

4.2 First article inspection planning

a) The organization shall have a process to plan for completion of FAI or shall plan FAI activities prior to the first production run.

b) FAI planning shall address the activities to be performed throughout the FAI process and identify the responsible organizations for those activities.

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

1) Determination of design characteristic inspection and sequencing for inspection of characteristics not measurable in the final product.

2) Extraction of DPD design characteristics required for product realization that are not fully defined on 2D drawings, including tolerances for nominal dimensions.

3) Determination of objective evidence to be included in the FAIR for each design characteristic.

4) 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.

5) Determination that key characteristic and critical item requirements are identified, as applicable (see IAQG standards, EN 9100 and EN 9103 for guidance/direction).

6) Determination when part specific gauges and tooling are required. These gauges and tooling are identified, qualified, and traceable, as appropriate.

7) Provide for customer FAI review, if required.

8) Identification of events requiring an updated FAI (see 4.6).

4.3 Digital product definition requirements

a) 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 shall be extracted, verified, and included in the FAIR.

b) The organization shall:

1) Establish a process to extract the applicable DPD design characteristics.

2) Extract the DPD design characteristics required for product realization.

3) Ensure the production, inspection, and operations requiring verification have been completed as planned to achieve DPD design characteristics.

4.4 Nonconformance handling

a) The FAI with design characteristic nonconformance(s) is “not complete”. An FAI with noted nonconforming design characteristics may have Form 1, “Part Number Accountability”, (see field 19) signed and shall be noted as “FAI Not Complete”.

NOTE See Annex B for EN 9102 forms (reference 4.7.1).

b) When processing a FAIR with documented nonconformances:

1) Record the nonconforming design characteristics on Form 3, “Characteristic Accountability, Verification, and Compatibility Evaluation”.

2) Record the nonconformance document reference number on Form 3 (see field 11).

3) Check the box “FAI Not Complete” on Form 1 (see field 19).

NOTE This European Standard does not control disposition of the nonconformance.

4) Sign Form 1 (see field 19) per supporting form instructions.

c) The organization shall implement corrective action(s) and perform a partial FAI for all affected characteristics on the next production run, after implementation of the associated corrective action(s). If the partial FAI does not clear all identified nonconformances, 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.

4.5 Evaluation activities

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

a) 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.

b) Review supporting documentation in the FAI (e.g., inspection data, test data, Acceptance Test Procedures, special process approvals and certifications) for completeness.

c) Verify that the raw material and special process certifications call out the correct specification, material types, conditions, and approvals.

d) Verify that required customer approved sources are utilized.

e) Review nonconformance documentation included in the FAIR for completeness.

f) Verify that required designed tooling (e.g., part specific gauges) are used and appropriately documented on Form 3.

g) Verify that every design characteristic requirement is accounted for, uniquely identified, and has inspection results traceable to each unique identifier.

h) 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.

i) Verify part marking is legible, correct in content and size, and properly located per applicable specifications.

4.6 Partial or re-accomplishment of first article inspection

a) The FAI requirement, once invoked, shall continue to apply even after initial compliance.

b) The FAI requirements may be satisfied by a partial FAI that addresses only the changes from a baseline part number provided all other characteristics were conforming on the previous FAI and are produced by the original production processes.

c) When a partial FAI is performed, the organization shall, as a minimum, complete the affected fields in the FAI forms.

d) When the organization performs a partial FAI, the organization shall record the “Baseline Part Number”, including the revision level and reason for the partial FAI on Form 1 (see field 14).

e) FAI requirements may be satisfied by a previously approved FAI performed on identical characteristics of similar parts produced by identical means. When FAI requirements (partial or full) are satisfied in this manner, identify the “Baseline Part Number” on Form 1 (see field 14).

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

   1) A change in the design characteristics affecting fit, form, or function of the part.

2) 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.

3) A change in numerical control program or translation to another media that can potentially affect fit, form, or function.

4) A natural or man-made event, which may adversely affect the manufacturing process.

5) An implementation of corrective action required to complete a previous FAI, as described in 4.4.

6) 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.

4.7 Documentation

4.7.1 Forms

a) Annex B contains forms that comply with the documentation requirements of this European Standard. Each field in the forms is designated with a unique reference number and is identified as:

- (R) – Required: This is mandatory information.
- (CR) – Conditionally Required: This field shall be completed, when applicable to the product (e.g., serial number shall be entered when the product has an associated serial number) or required by the customer.
- (O) – Optional: This field is provided for convenience; the field may be left blank.

b) Forms contained in Annex B should be used to document the results of the FAI.

c) Forms other than those depicted in Annex B may be used; however, they shall contain all "Required" and "Conditionally Required" information and have the same field reference numbers.

d) Use of forms from a previous EN 9102 standard revision (e.g., AS9102A) is acceptable, provided the current form instructions are utilized.

e) All forms shall be completed either electronically or in permanent ink.

f) All forms shall be completed in English or in a language specified by the customer.

g) Continuation sheets and insertion of additional rows are acceptable.

4.7.2 Characteristic accountability

a) The organization shall verify every design characteristic, during the FAI, and record the associated results. Every design characteristic shall have its own unique characteristic number.

b) Reference characteristics may be omitted from the FAI.

c) More than one line may be used, if needed, for any characteristic.

d) 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.

4.7.3 Record results

a) The organization shall record the requirements and results in the units specified on the drawing, DPD, or specification, unless otherwise approved by the customer.

b) Results from inspection of design characteristics shall be expressed in quantitative terms (i.e., variable data), when a design characteristic is expressed by numerical limits. Except that attribute data (e.g., pass/fail) may be used in lieu of variable data when:

- No inspection technique resulting in variable data is feasible; or
- Designed tooling or qualified tooling is consistently used as a check feature and a go/no-go feature has been established for the specific characteristic. When qualified tooling (e.g., radius gauges) are used as a go/no-go gauge, record the gauge value or range (e.g., minimum/maximum value), as applicable.

c) Attribute data shall be used, when the design characteristic does not specify numerical limits (e.g., break all sharp edges).

4.8 Control of records

FAI documentation required by this European Standard shall be considered a quality record. The organization shall retain the appropriate FAI documentation while the product is being produced and, at a minimum, retain them according to applicable customer or regulatory requirements.

5 Notes

A change bar (|) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

Annex A
(informative)
Acronym log

BOM	Bill of Materials
CMM	Coordinate Measurement Machine
COTS	Commercial-Off-the-Shelf
DPD	Digital Product Definition
FAI	First Article Inspection
FAIR	First Article Inspection Report
IAQG	International Aerospace Quality Group
2D	Two-dimensional
3D	Three-dimensional

Annex B
(normative)
9102 Forms and supporting form instructions

FORM 1 PART NUMBER ACCOUNTABILITY

FORM 2 PRODUCT ACCOUNTABILITY — MATERIALS, SPECIAL PROCESSES, AND FUNCTIONAL TESTING

FORM 3 CHARACTERISTIC ACCOUNTABILITY, VERIFICATION, AND COMPATIBILITY EVALUATION

This Annex provides the instructions to complete the associated 9102 forms. Each input field is identified as:

- **(R) – Required**: This is mandatory information.

  NOTE These fields are depicted in **bold** font.

- ***(CR) Conditionally Require*** **–** This field shall be completed when applicable to the product (e.g., serial number shall be entered when there is a serial number) or when required by the customer.

  NOTE These fields are depicted in ***bold italic*** font.

- (O) Optional – This field is provided for convenience; the field may be left blank.

  NOTE These fields are depicted in standard font.

Form 1 — PART NUMBER ACCOUNTABILITY

Sheet ___ of ___

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: ____ 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.			
15. Part Number:	***16. Part Name:***	***17. Part Serial Number:***	***18. FAIR Number:***
19. Signature: __ FAI Complete __ FAI Not Complete			**20. Date:**
21. Reviewed By:			22. Date:
23. Customer Approval :			24. Date:

FORM 1 – PART NUMBER ACCOUNTABILITY FORM INSTRUCTIONS

This form is used to identify the product that is having the First Article Inspection (FAI) conducted on (e.g., detail part, sub-assembly, assembly); referred to as "FAI part".

NOTE Data fields 1 thru 4 are repeated on all forms for convenience and traceability. Any subsequent changes to "data fields" 1 thru 4 need to be made to all pages.

1. (R) **Part Number:** Number of the FAI part [e.g., customer part number contained on the purchasing documents; part number from the associated Bill of Materials (BOM); manufacturer part number for internal parts, when customer part number is not available].

2. (R) **Part Name:** Name of the FAI part.

3. (CR) ***Serial Number:*** Serial number of the FAI part; unique identifier assigned to a detail part, sub-assembly, or assembly by the organization or customer.

4. ***(CR)*** ***FAIR Number:*** Reference number that identifies the First Article Inspection Report (FAIR); this may be an internal report number.

5. (CR) ***Part Revision Level:*** 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 drawing or DPD revision (see field 7) does not always affect all parts contained on a drawing or DPD.

6. (CR) ***Drawing Number:*** Drawing number or DPD data set associated with the FAI part; drawing may be from customer, internal system, or design definition.

7. (CR) ***Drawing Revision Level:*** The revision level of the drawing or DPD data set associated with the FAI part. If the drawing has not been revised, indicate as such (e.g., N/C, No Change).

8. (CR) ***Additional Changes:*** Provide reference numbers of any changes that are incorporated in the product, but not reflected in referenced drawing/part revision level (e.g., change in design, engineering changes, manufacturing changes, deviation or exclusion from certain drawing or DPD requirements).

9. (R) **Manufacturing Process Reference:** Reference number that provides traceability to the manufacturing record of the FAI part (e.g., router number, manufacturing plan number). Additional information such as lot number, batch number, date code, or line number may be included, as needed, to provide traceability to the specific manufacturing lot.

10 (R) **Organization Name:** Name of the organization performing the FAI.

11. (O) Supplier Code: A unique number given by customer to the organization; sometimes referred to as Vendor Code, Vendor Identification Number, or Supplier Number.

12. (O) P.O. Number: Customer purchase order number, if applicable.

13. (R) **Detail Part / Assembly FAI:** Check, as appropriate.

14. (R) **Full FAI / Partial FAI:** 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 (e.g., changes in design, process, or manufacturing location). For partial FAIs based on similar parts (reference EN 9102, 4.6), provide the approved configuration FAI part number, including revision level.

Baseline Part Number: For a partial FAI, provide the previous FAI part number or approved configuration (including revision level) to which this partial FAI is performed. State the reason for the current FAI (e.g., changes in design, process, or manufacturing location). For a partial FAI based on similar parts (reference EN 9102, 4.6), provide the approved configuration FAI part number, including revision level.

NOTE Data Fields 15, 16, 17, and 18: This section is required only if the part number identified in field 1 is an assembly requiring lower level parts (i.e., detail parts) to be installed.

15. (CR) ***Part Number:*** Part number included in the assembly and items from the BOM included in the drawing, DPD, or next level assembly. Typically these are the part numbers, standard catalogue items, or sub-assembly numbers required to complete the product noted in field 1.

16. (CR) ***Part Name:*** Name of the part installed in the assembly.

17. (CR) ***Part Serial Number:*** Serial number of the part that is installed in the assembly.

18. (CR) ***FAIR Number:*** Report number for the detail parts and associated assemblies.

19. (R) **Signature:** Printed name or unique identification, and signature of the person approving the FAIR. This signature certifies the evaluation activities in EN 9102, 4.5 are complete and the FAIR is approved.

NOTE Electronic identification or signature are both acceptable.

Check “FAI Complete”, if all characteristics are conforming. Check “FAI Not Complete”, if nonconforming characteristics are documented in accordance with EN 9102, 4.4.

20. (R) **Date:** Date when field 19 was signed.

21. (O) Reviewed By: Printed name or unique identification, and signature of the person from the organization who approved the FAIR.

NOTE Electronic identification or signature are both acceptable.

22. (O) Date: Date when field 21 was signed.

23. (O) Customer Approval: Used by customer to record approval, if required.

24. (O) Date: Date when field 23 was signed.

FORM 2 — PRODUCT ACCOUNTABILITY – MATERIALS, SPECIAL PROCESSES, AND FUNCTIONAL TESTING

Sheet ___ of ___

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:***
11. Functional Test Procedure	***12. Acceptance Report Number:***				
13. Comments					
14. Signature				**15. Date**	

FORM 2 — PRODUCT ACCOUNTABILITY – MATERIALS, SPECIAL PROCESSES, AND FUNCTIONAL TESTING FORM INSTRUCTIONS

This form is used if any materials, special processes, or functional testing is defined as a design characteristic.

NOTE Data fields 1 thru 4 are repeated on all forms for convenience and traceability. Any subsequent changes to "data fields" 1 thru 4 need to be made to all pages.

1. (R) **Part Number:** Number of the FAI part [e.g., customer part number contained on the purchasing documents; part number from the associated Bill of Materials (BOM); manufacturer part number for internal parts, when customer part number is not available].

2. **(R)** **Part Name:** Name of the FAI part.

3. (CR) ***Serial Number:*** Serial number of the FAI part; unique identifier assigned to a detail part, sub-assembly, or assembly by the organization or customer.

4. (*CR)* ***FAIR Number:*** Reference number that identifies the First Article Inspection Report (FAIR); this may be an internal report number.

5. (CR) ***Material or Process Name:*** Name of applicable materials or special processes.

6. ***(CR)*** ***Specification Number:*** Provide the following information:

- Material specifications and material form (e.g., sheet, bar) for all materials incorporated into the FAI part (e.g., weld or braze filler).
- Special process specifications; including class, if applicable, and permitted substitutions.
- If standard catalogue items (e.g., fasteners) or COTS are modified, then list that standard hardware or COTS item.

NOTE Non-modified standard catalogue items are listed on Form 1, "Part Number Accountability".

7. (O) Code: Any required code from the customer for material or process listing, as applicable.

8. ***(CR)*** ***Supplier:*** Identify supplier name, address, and code performing special processes or supplying material. Supplier name and address may be used, when supplier code is not available or not adequate for identification.

9. (CR) ***Customer Approval Verification:*** Indicate if the special process(es) or material sources are approved by the customer. Enter "Yes" if approved; "No" if approval is required, but process source is not approved; or "NA" if customer approval is not required.

10. (CR) ***Certificate of Conformance Number:*** The applicable certificate number (e.g., special process completion certification, raw material test report number, modified standard catalogue item compliance report number, traceability number).

11. (CR) ***Functional Test Procedure Number:*** Functional Test Procedure number identified as a design characteristic.

12. (CR) ***Acceptance Report Number:*** The functional test certification indicating that test requirements have been met.

13. (O) Comments: Provide supporting comments, as applicable.

14. (R) **Signature:** Printed name or unique identification, and signature of the person who prepared and approved this form. Signature indicates that all applicable materials, special processes, and functional testing are accounted for, meet requirements, are properly documented, and all associated nonconformances are documented on EN 9102 Form 3, "Characteristic Accountability, Verification, and Compatibility Evaluation".

NOTE Electronic identification and signature are both acceptable.

15. (R) **Date:** Date when field 14 was signed.

FORM 3 — CHARACTERISTIC ACCOUNTABILITY, VERIFICATION, AND COMPATIBILITY EVALUATION

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 Tooling	11. Nonconformance Number	14. Additional Data / Comments	
12. Signature							13. Date	

FORM 3 — CHARACTERISTIC ACCOUNTABILITY, VERIFICATION, AND COMPATIBILITY EVALUATION FORM INSTRUCTIONS

This form is used to record inspection results for the design characteristics and to document any applicable nonconformances (reference EN 9102, 4.4).

NOTE Data fields 1 thru 4 are repeated on all forms for convenience and traceability. Any subsequent changes to "data fields" 1 thru 4 need to be made to all pages.

1. (R) **Part Number:** Number of the FAI part [e.g., customer part number contained on the purchasing documents; part number from the associated Bill of Materials (BOM); manufacturer part number for internal parts, when customer part number is not available].

2. **(R)** **Part Name:** Name of the FAI part.

3. (CR) ***Serial Number:*** Serial number of the FAI part; unique identifier assigned to a detail part, sub-assembly, or assembly by the organization or customer.

4. (*CR)* ***FAIR Number:*** Reference number that identifies the First Article Inspection Report (FAIR); this may be an internal report number.

5. (R) **Char. No.:** Unique assigned number for each design characteristic.

NOTE A single design callout that applies to multiple characteristics may be recorded as one characteristic number.

6. (CR) ***Reference Location*****:** Location of the design characteristic [e.g., drawing zone (page number and section), DPD model location, specification callout].

7. (CR) ***Characteristic Designator:*** If applicable, record characteristic type [e.g., critical items (see EN 9100, 3.3), key characteristics (see EN 9100, 3.4), flight safety, defined by customer].

8. (R) **Requirement:** Specified requirement for the design characteristic (e.g., drawing or DPD dimensional characteristic with associated nominal dimension and tolerances, drawing notes, specification requirements).

NOTE The organization shall record the requirements in the units specified on the drawing, DPD, or specification, unless otherwise approved by the customer.

9. (R) **Results:** List measurement(s) obtained for the design characteristics.

NOTE The organization shall record the results in the units specified on the drawing, DPD, or specification, unless otherwise approved by the customer.

- 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 EN 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 EN 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.

NOTE Coordinate Measurement Machine (CMM) data alone would not be acceptable for a positional tolerance; the results shall show the actual positional 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 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).

10. (CR) ***Designed / Qualified Tooling:*** 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 (e.g., minimum / maximum value), as applicable.

11. (CR) ***Nonconformance Number:*** If the characteristic is found to be nonconforming, record a nonconformance document reference number.

12. (R) **Signature:** 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 (reference EN 9102, 4.4).

NOTE Electronic identification and signature are both acceptable.

13. (R) **Date:** Date when field 12 was signed.

14. (O) Additional Data / Comments: This area is reserved for optional fields; add additional columns, as required, by the organization or customer.

Bibliography

[1] ISO 16792, *Digital Product Definition Data Practices*

[2] ASME Y14.41, *Digital Product Definition Data Practices*

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BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

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