

# QRS-101

First Article Inspection



# QRS-101

## First Article Inspection

Issue Date: June 2020 Issue: 04

### CHANGES LOG

Issue	Approval Date	Main changes	Interested Paragraphs
00	April 2015	First Issue – Supersedes IQ S001	All
01	February 2017	<ul style="list-style-type: none"> <li>Company Name Change from AgustaWestland (AW) into Leonardo Helicopters (LH)</li> <li>Articles not under FAI applicability</li> <li>Definitions</li> <li>Management of FAI Plan</li> <li>FAI Declaration</li> </ul>	All 2 5 8 10.2
02	June 2018	Document significantly rewritten and reformatted	All
03	June 2019	<ul style="list-style-type: none"> <li>Acronyms, Definitions and Abbreviations</li> <li>Supplier involved</li> <li>Planning of FAI activities</li> <li>Delta FAI requirements</li> <li>FAIR contents</li> <li>Delivery Documentation</li> </ul>	4 5 6 7.5 8.1 9.5
04	June 2020	Clarification about Applicability Addition of reference to §9.5 Clarification about FAIR submission to LH for a POA Holder Requirements for Re-accomplishment of First Article Inspection	§2 §5 §6.1 §7.5

First Article Inspection	QRS-101 Issue 04	Page 2/17
	June 2020	

		Clarification of NOTES at the end of paragraph	§8.1
		Addition of Remarks about FAIR Evaluation	§8.2
		Restore of reference to Record Retention Table	§9.4
		Clarification about FAI documentation package to be sent to LH	§9.5

## APPLICABLE DOCUMENTS

This document *shall* be applied together with the main document (QRS-01 Quality Requirements for Suppliers) and with the other applicable modules

## CONTENTS

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>APPLICABILITY .....</b>	<b>4</b>
<b>3</b>	<b>EFFECTIVE DATE .....</b>	<b>5</b>
<b>4</b>	<b>ACRONYMS, DEFINITIONS AND ABBREVIATIONS .....</b>	<b>5</b>
4.1	ACRONYMS AND ABBREVIATIONS .....	5
4.2	DEFINITIONS .....	6
<b>5</b>	<b>SUPPLIERS INVOLVED .....</b>	<b>8</b>
<b>6</b>	<b>PLANNING OF FAI ACTIVITIES .....</b>	<b>8</b>
6.1	PLANNING OF FAI ACTIVITIES FOR MANUFACTURERS .....	8
6.2	PLANNING OF FAI ACTIVITIES FOR SUBCONTRACTORS .....	8
6.3	INDICATIONS FOR PLANNING OF FAI ACTIVITIES (MANUFACTURERS AND SUBCONTRACTORS, AS APPLICABLE) .....	9
6.4	APPROVAL OF PLANNING OF FAI ACTIVITIES / FAI PLAN .....	9
6.4.1	<i>Approval of Planning of FAI Activities (for Manufacturers) .....</i>	<i>9</i>
6.4.2	<i>Approval of FAI Plan (for Subcontractors) .....</i>	<i>10</i>
6.5	MODIFICATION MANAGEMENT FOR MANUFACTURERS .....	10
6.6	MODIFICATION MANAGEMENT FOR SUBCONTRACTORS .....	10
<b>7</b>	<b>FIRST ARTICLE INSPECTION ACCOMPLISHMENT .....</b>	<b>10</b>
7.1	REQUIREMENTS .....	10
7.2	DIGITAL PRODUCT DEFINITION REQUIREMENTS .....	11
7.3	NON-CONFORMANCES HANDLING .....	11
7.4	EVALUATION ACTIVITIES .....	12
7.5	DELTA (PARTIAL) OR RE-ACCOMPLISHMENT OF FIRST ARTICLE INSPECTION .....	12
<b>8</b>	<b>FIRST ARTICLE INSPECTION REPORT .....</b>	<b>14</b>
8.1	FAIR CONTENTS .....	14
8.2	FAIR EVALUATION .....	15
8.2.1	<i>FAI Declaration for Manufacturers .....</i>	<i>15</i>
8.2.2	<i>FAI Declaration for Subcontractors .....</i>	<i>16</i>
<b>9</b>	<b>DOCUMENTATION .....</b>	<b>16</b>
9.1	FORMS .....	16
9.2	CHARACTERISTIC ACCOUNTABILITY .....	16
9.3	RECORD RESULTS .....	16
9.4	CONTROL OF RECORDS .....	17
9.5	DELIVERY DOCUMENTATION .....	17
9.6	RIGHT OF ACCESS .....	17
<b>10</b>	<b>APPENDICES, ANNEXES AND FORMS .....</b>	<b>17</b>

First Article Inspection	QRS-101 Issue 04	Page 4/17
	June 2020	

## 1 Purpose

The primary purpose of first article inspection is to validate that product realization processes are capable to produce articles and assemblies that meet engineering and design requirements. A well planned and executed first article inspection *will* provide objective evidence that manufacturer's processes can produce compliant articles and that Supplier has understood and incorporated associated requirements. First article inspection *will*:

- provide confidence that the article realization processes are capable to produce conforming product,
- demonstrate that the Supplier of the product has understood 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.

A first article inspection 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 non-conformances,
- identify product realization processes that are not capable of producing conforming product and initiate and/or validate corrective actions.

The purpose of this procedure is to define the requirements and relevant responsibilities concerning the process of First Article Inspection (FAI) for articles and assemblies supplied to Leonardo Helicopters related to the validation and revalidation of the production process.

The reference used is EN/AS9102 standard in order to standardize FAI process requirements to the possible greatest extent and to provide a consistent process and documentation requirements for verification of articles and assemblies. All the forms *must* be filled in English, unless otherwise agreed.

## 2 Applicability

This procedure is applicable to all Leonardo Helicopters (LH) Suppliers according to Table 1 of QRS-01. The supplier *shall* flow down the requirements of this procedure to its suppliers or processor involved in the manufacturing process.

This procedure applies to installations, assemblies, sub-assemblies, and detail articles including castings, forgings, and modifications both to standard catalogue and to Commercial Off the Shelf (COTS) items.

Unless contractually required, this procedure does not apply to:

- development and prototype parts that are not considered as part of the first production run
- procured standard catalogue items (COTS) or deliverable software
- E/TSO Certified Articles
- engine/APU articles if not included in Leonardo Helicopters Type Design
- international standards
- STC articles, also if included in a configuration applicable to a LH delivered product if not included in Leonardo Helicopters Type Design
- LH standard parts **already covered by AWTR999**
- Suppliers of raw material.

In case of experimental or not yet approved or not serial production items, including:

- Unique single run production orders, not intended for ongoing production (e.g., out-of-production spares).
- instrumented P/N (drawing type indicator “U”),
- experimental coded P/Ns (drawing type indicator “E” or “T”),

the activity shall be identified as “Test Article Conformity” selecting the appropriate box in the FAI form (see QRS-115 for process description and authorization).

### 3 Effective date

Issue date

## 4 Acronyms, definitions and abbreviations

### 4.1 Acronyms and abbreviations

ATP	Acceptance Test Procedure
ATR	Acceptance Test Report
CDR	Critical Design Review
CoC	Certificate of Conformance
COTS	Commercial Off The Shelf
COMO	Coordination Memo
DDS	Design Data Set
DIP	Dimensional Inspection Plan
DPD	Digital Product Definition
DWG	Drawing
FAI	First Article Inspection
FAIR	First Article Inspection Report
KC	Key Characteristic
LH	Leonardo Helicopters
P/N	Part Number
PMA	Parts Manufacturer Approval
PS	Procurement Specification

S/N	Serial Number
SCD	Source Control Drawing
STCH	Supplemental Type Certificate Holder
TCH	Type Certificate Holder
(E)TSO	(European) Technical Standard Order

## 4.2 Definitions

**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)

**Ballooned Drawing:** a drawing with graphics aids (e.g. balloons with identification numbers or letters) to clearly identify relevant design characteristics. To the purpose of this procedure, the purpose of a Ballooned Drawing is to verify that every design characteristic requirement is accounted for, uniquely identified, and has inspection results traceable to each unique identifier.

**Baseline Part Number:** This refers to previous FAI part number or approved configuration, including revision level, to which a partial FAI is performed.

**Critical Characteristic:** A significant characteristic on a critical part that in addition to the above definition, if not complied to, could generate a catastrophic failure. A critical part *shall* have, at least, one critical characteristic, but could also have significant characteristics. A non-critical part could only have significant characteristic.

**Commercial Off The Shelf items:** Commercially available items intended by design to be procured and utilized without modification (e.g., common electronic components)

**Deliverable Software:** Embedded or loadable airborne, space borne, or ground support software components which are part of an aircraft type design, weapon system, missile, or spacecraft.

**Dimensional Inspection Plan (DIP):** It is the 2D graphical representation of a DPD in order to give indications to inspect the parts, i.e. the set of functional and control dimensions.

**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 an article.

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.

First Article Inspection	QRS-101 Issue 04	Page 7/17
	June 2020	

**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, and sequence of welding and heat treat). These provide assurance of intended characteristics that could not be otherwise defined.

**First Article Inspection:** 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.

**First Article Inspection Report:** The forms and package of documentation for a part number, sub-assembly, assembly, or installation including first article inspection results, as defined by this procedure, after the qualification of the part.

**First Production Run Articles:** First group of one or more articles that are the result of a planned process designed to be used for future production of these same articles (after DDS Approval by LH).

**Manufacturer :** See QRS-01 main document

**Significant Characteristic:** A characteristic of the part, referenced on the related drawing that if not complied to, could provide malfunction and/or behaviours different from the ones the part has been designed to.

**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.

**Subcontractor:** See QRS-01 main document

**Unique Single Run:** The initial group of one or more articles that are the result of a planned process designed not to be used for future production.

For general definitions, refer to EN ISO 9000, EN 9100 and IAQG Dictionary. The use of applicable section of the IAQG SCM (Supply Chain Management Handbook) is recommended to supplement this procedure and for guidelines.



First Article Inspection	QRS-101 Issue 04	Page 8/17
	June 2020	

## 5 Suppliers Involved

Every supplier that manufactures articles as described in paragraph 2 of this procedure *shall* perform a first article inspection on the First Production Run.

Where a FAI is requested by Purchase Order (identified by an LH FAI number), the First Article Inspection *shall* be completed before the delivery to LH of the first Article of a Part Number (P/N), and provided to LH before shipment of the parts.

Where a FAI (or A Delta-FAI) is applicable, even if not directly requested by LH Purchase Order with a LH FAI number, a full FAIR *shall* be completed by the supplier and the supplier FAI identification number *shall* be specified in the delivery documentation (refer to § 9.5 for details). The full FAIR package shall be available upon request for LH review.

## 6 Planning of FAI Activities

The Supplier *shall* have a process to plan for completion of FAI activities prior to the first production run. The FAI Planning *shall* address the activities to be performed throughout the FAI process and identify the responsible organizations for those activities.

### 6.1 Planning of FAI Activities for Manufacturers

The Planning of the FAI activities, prepared according with EN/AS9102 and submitted according with 6.4.1, *shall* list at least the 100% of the characteristics mentioned on LH and Supplier drawings/specifications (KC, dimensions, technical, drawing notes, functional and quality requirements).

If the Supplier is a POA Holder, and it has applied to include the P/N into its own **capability list**, the FAI requirements applies as a quality requirement according to this procedure, and the supplier *shall* always perform a FAI, which is not subject to LH approval, but the Supplier *shall* communicate the positive closure of FAI to LH by submitting a copy of the FAIR to the relevant Quality Control. After successful completion of FAI, the P/N *shall* be included into the supplier capability list. In the meantime, the part shall be delivered with EASA Form 1 Prototype.

On the contrary, when a POA Holder is not required to exercise his privileges by LH, and the P/N is delivered without an Airworthiness Certificate, the FAIR is submitted to the relevant Quality Control.

*Note: upon request, access to sub-tier FAI documentation shall be granted to LH.*

### 6.2 Planning of FAI Activities for Subcontractors

Every Subcontractor involved into FAI activities *shall* have an internal procedure describing how FAI activities *will* be deployed, including any activities performed by sub-tiers.

Where requested by LH, LH Manufacturing Engineering can either issue a FAI plan to be carried out, partially or completely, by the Subcontractor or to evaluate FAI plan prepared

First Article Inspection	QRS-101 Issue 04	Page 9/17
	June 2020	

by the Subcontractor itself (with a LH number) in advance to the performance of FAI activities.

### 6.3 Indications for Planning of FAI Activities (Manufacturers and Subcontractors, as applicable)

The Planning of FAI Activities *shall* be produced using the forms “Part Number Accountability”, Product Accountability – Materials, special processes, and functional testing” and “Characteristic Accountability, Verification, and Compatibility Evaluation” in accordance with QRS\_101\_F01, QRS\_101\_F02 and QRS\_101\_F03 forms or EN/AS9102. In addition, the preparation of a process control document as per EN/AS9103 standard is encouraged to identify and control the key characteristics variation through the manufacturing process across the service life.

The supplier *should* consider the following activities for the first production run:

- determination of design characteristic inspection and sequencing for inspection of characteristics not measurable in the final product,
- extraction of DPD design characteristics required for product realisation that are not fully defined on 2D drawings, including tolerances for nominal dimensions and acceptance criteria,
- determination of objective evidence to be included in the FAIR for each design characteristic,
- determination that approved special process, laboratory, material, and customer required sources are identified, as applicable, and that the manufacturing planning, routing, and purchase document calls out the correct specification and relevant sources,
- determination that key characteristic and critical item requirements are identified, as applicable. The application of the EN/AS9103 standard is encouraged.
- determination when part specific gages and tooling are required. These gages and tooling are identified, approved, and traceable, as appropriate,
- provide for LH FAI review, if required,
- identification of events requiring an updated FAI ([paragraph 7.5](#)),
- defined Corrective Actions

### 6.4 Approval of Planning of FAI Activities / FAI Plan

#### 6.4.1 Approval of Planning of FAI Activities (for Manufacturers)

The planning of the FAI activities *shall* be part of the CDR that *must* be jointly performed by LH and Supplier.

During the CDR, the planning of the FAI activities, consisting of prefilled forms F01, F02, F03 with all the activities, tests, inspections and verifications to be performed, prepared by the supplier, *shall* be submitted to the LH Engineering Focal Point for joint review with LH Production Organization.

First Article Inspection	QRS-101 Issue 04	Page 10/17
	June 2020	

In the event a delta-FAI is needed (see paragraph 7.5), a delta-FAI planning (prefilled forms F01, F02, F03) *shall* be raised in advance the performance of delta-FAI activities and *shall* be sent to LH Engineering Focal Point for review in a new CDR in case of impact on Design Data, or approval through COMO if there is no impact on Design Data (see also QRS-115).

*Note: upon request, access to sub-tier FAI documentation shall be granted to LH.*

#### **6.4.2 Approval of FAI Plan (for Subcontractors)**

In case the LH Manufacturing Engineering decides to approve a FAI Plan prepared by a Subcontractor, the Supplier *shall* send the FAI Plan to the relevant Manufacturing Engineering sufficiently in advance prior to the start of manufacturing activities, in order to allow LH evaluation.

LH Manufacturing Engineering evaluates the FAI Plan received, notifying the approval/comments to the Supplier.

#### **6.5 Modification Management for Manufacturers**

In case of changes to technical data (even if minor), the Supplier *shall* inform the LH Engineering Focal Point to determine if a "Delta FAI" is requested (see 6.4.1).

Remark: if a critical characteristic of a critical part is affected, a delta FAI is always required/applicable.

#### **6.6 Modification Management for Subcontractors**

In case one of the changes described in paragraph 7.5 occurs, the supplier shall communicate these changes to the relevant LH Manufacturing Engineering function for the possible reissue of a FAI.

### **7 First Article Inspection Accomplishment**

#### **7.1 Requirements**

First article inspection *shall* be performed on new articles representative of the first production run. The supplier *shall* use a representative item from the first production run of a new article to verify that the production processes, production documentation and tooling have the capability to produce articles that meet the established requirements. The Supplier *shall* also ensure that the processes are consistent and controlled to achieve repeatable characteristics on the article, by identifying the relevant key characteristics and planning appropriate article/process controls (FAI repetitions, Statistical Process Controls, monitoring of the key characteristics etc.).

In case of subassemblies manufactured by other suppliers, the main supplier *shall* indicate how the subcontracting supplies have been qualified.

First Article Inspection	QRS-101 Issue 04	Page 11/17
	June 2020	

In case of finished articles coming from castings or forgings, the supplier *shall* also accomplish FAI and submit it to LH for semi-finished parts.

For assemblies, first article inspection *shall* be performed on all the subcomponents of the main assembly and on the main assembly itself and provided to LH.

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

## 7.2 Digital Product Definition Requirements

When design requirements are in digital format and no traditional 2D drawing information is available, DPD design characteristic required for product realization *shall* be extracted, verified and included in the FAIR.

The supplier *shall* extract the DPD design characteristics required for product realization and ensure the production, inspection and operations requiring verification have been completed as planned to achieve DPD design characteristics.

## 7.3 Non-conformances handling

The first article inspection with non-conformances on design characteristics (that can invalidate FAI results), non-conforming articles or scrapped parts, is “not complete”. In case of first article inspection with non-conforming design characteristics, the form QRS.101.F01 (or EN/AS9102 equivalent) “Part Number Accountability” *shall* be filled, signed and noted as “FAI Not Complete”.

When processing a FAIR with documented non-conformances:

- Record the nonconforming design characteristics on Form QRS.101.F03 (or EN/AS9102 equivalent) “Characteristic Accountability, Verification, and Compatibility Evaluation”.
- Record the non-conformance document reference number on Form QRS.101.F03 (or EN/AS9102 equivalent) “Characteristic Accountability, Verification, and Compatibility Evaluation” (see Field 11)
- Select the box “FAI Not Complete” on Form QRS.101.F01 (or EN/AS9102 equivalent) “Part Number Accountability”.
- Sign Form QRS.101.F01 (or EN/AS9102 equivalent) “Part Number Accountability” per supporting form instructions.

The supplier *shall* implement corrective action(s) and perform a delta first article inspection or re-issue full first article inspection if requested 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 non-conformances, the first article inspection is still “not complete” and the requirement to complete the first article inspection is still in effect.

Such articles *shall* be sent to LH under Concession.

## 7.4 Evaluation Activities

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

- Review documentation for the manufacturing process (e.g., routing sheets, manufacturing or quality plans, manufacturing work instructions) to ensure all operations are complete as planned and call out the correct specification, material types, conditions, and approvals.
- Review supporting documentation in the FAI (e.g., inspection data, test data, Acceptance Test Procedures, special process approvals and certifications) for completeness.
- Verify that the raw material and special process certifications call out the correct specification, material types, conditions, and approvals.
- Verify that required customer approved sources are utilized.
- Review non-conformance documentation included in the FAIR for completeness.
- Verify that required designed tooling (e.g., part specific gages) are used and appropriately documented on QRS.101.F03 (or EN/AS9102 equivalent) “Characteristic Accountability, Verification, and Compatibility Evaluation”.
- Verify that every design characteristic requirement is accounted for, uniquely identified, and has inspection results traceable to each unique identifier.
- Verify the design characteristics that are the output of the manufacturing process are measured, inspected, tested, or verified to determine conformance, including DPD characteristics.
- Verify part marking is legible, correct in content and size, and properly located per applicable specifications.
- Verify that personnel performing Special Processes is properly qualified.

## 7.5 Delta (Partial) or Re-accomplishment of First Article Inspection

- The FAI requirement, once invoked, *shall* continue to apply even after initial compliance.
- **The supplier *shall* have a system in place to ensure repeatability of key characteristics in production. The application of EN/AS 9103, as well as Statistical Process Control in general, is an acceptable means of compliance.**  
**If no effective system is in place, the supplier is requested to repeat the FAI every two years at their expenses, checking that the key characteristics are not changed since the last FAI. This requirement will be verified by LH during Supplier surveillance activity.**
- The FAI *may* be satisfied by a delta first article inspection that addresses only the changes from a baseline part number provided all other characteristics were conforming on the previous first article inspection and are produced by the original production processes.
- When a delta first article inspection is performed, the supplier *shall*, as a minimum, complete the affected fields in the first article inspection forms.

First Article Inspection	QRS-101 Issue 04	Page 13/17
	June 2020	

- When the supplier performs a delta first article inspection, the supplier *shall* record the “Baseline Part Number” or the “Baseline FAI Number”, including the revision level and reason for the partial first article inspection on Form “Part Number Accountability”.
- In case of repetitive non-conformances related to the manufacturing process, even if the process has already been frozen through a positive FAI, a re-accomplishment of a First Article Inspection can be requested by LH after a detailed analysis performed by the Supplier and sent to LH for acknowledgement or performed by LH itself.
- First article inspection requirements *may* be satisfied by a previously approved FAI performed on identical characteristics of similar articles produced by identical means. When first article inspection requirements (delta or full) are satisfied in this manner, identify the “Baseline Part Number” on Form QRS.101.F01 (or EN/AS9102 equivalent) “Part Number Accountability”
- The Supplier *shall* also take into consideration “qualification requirements” (if any) indicated in LH drawing/SCD/PS.
- The supplier *shall* perform a full first article inspection or a delta first article inspection for affected characteristics, when any of the following occurs:
  - a change in the design characteristics affecting airworthiness and safety aspects, fit, form, or function of the part, environmental aspects, mass property aspects, reliability aspects, drawing aspects, traceability aspects, in-service effects, manufacturability aspects, test aspects or cost/delivery aspects,
  - a change in manufacturing source(s), process(es), inspection method(s), location of manufacture (for the supplier or their sub-tiers), tooling, or materials that can potentially affect airworthiness and safety aspects, fit, form, or function of the part, environmental aspects, mass property aspects, reliability aspects, drawing aspects, traceability aspects, in-service effects, manufacturability aspects, test aspects or cost/delivery aspects,
  - a change in numerical control program or translation to another media that can potentially affect airworthiness and safety aspects, fit, form, or function of the part, environmental aspects, mass property aspects, reliability aspects, drawing aspects, traceability aspects, in-service effects, manufacturability aspects, test aspects or cost/delivery aspects,
  - a natural or man-made event, which *may* adversely affect the manufacturing process,
  - an implementation of corrective action required to complete a previous first article inspection, as described in [section 7.3](#),
  - 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.

First Article Inspection	QRS-101 Issue 04	Page 14/17
	June 2020	

## 8 First Article Inspection Report

An article inspection has to be considered “not complete” if only a specific number of tests have been performed. These minimum tests *shall* be agreed with LH and can refer but not limited to dimensional checks, weight check, and functional tests.

An article inspection has to be considered “complete” if all the tests related to the manufacturing process have been performed and all the required documents (related to conformance of the articles) requested in the FAI Planning documents are available and conform.

*Note: upon request, access to sub-tier FAIR documentation shall be granted to LH.*

### 8.1 FAIR contents

The FAIR package *shall* be composed by the following documents:

- Part A

QRS-101\_F01, QRS-101\_F02, QRS-101\_F03 (or EN/AS9102 equivalent forms).

Note: attachments to be reported in Part B

- Part B

The FAIR shall also include, at least, the following documentation, in the following order:

Index:

- Section 1 - drawing (LH DWG and, where applicable, SUPPLIER DWG approved by LH)
- Section 2 - ballooned drawing
- Section 3 - certificate of conformity of assy parts
- Section 4 - raw material certificates
- Section 5 - manufacturing plans endorsed by LH where applicable (see notes below)
- Section 6 - copy of work order or shop traveller frozen
- Section 7- picture of parts marking

and, where applicable:

- Section 8 - copy of Concessions
- Section 9 - FAI Reports of sub components
- Section 9 - surface and Heat treatment evidence
- Section 10 - metallurgical reports
- Section 11 - Special Processes certificate result evidence
- Section 12 - approved ATP and relative ATR

First Article Inspection	QRS-101 Issue 04	Page 15/17
	June 2020	

- Section 13 - a specific test report for articles including Complex Hardware (see QRS-117)
- Section 14 - additional attachments/documents.

#### NOTES:

All the characteristics defined in the Planning of FAI Activities *must* be fulfilled and evidences of conformity *shall* be provided.

Subcontractors only, *shall* send in advance the supplier **Master Manufacturing Plan** and related production documentation (DPD, DIP) for acceptance of relevant LH Manufacturing Engineering. This accepted documentation must be part of the FAIR. **For POA Holder subcontractors, this requirement applies for critical parts only.**

## 8.2 FAIR Evaluation

When a FAI requesting LH evaluation is considered “complete” by the Supplier, it *shall* be sent to LH Quality Control of the relevant plant for evaluation.

A complete FAIR document collection with traceable index of content, as per 8.1, *shall* be submitted, in electronic format.

**Remarks:** Both in case of Subcontractors and Manufacturers, for P/Ns classified as Non-Critical and Assemblies made of Non-Critical Parts, Subcontractors and Manufacturers do not have to submit the FAIR to Quality Control for approval. However, they are required to retain this documentation at their sites for potential review by LH, where required.

Evidence of a positive evaluation *will* be given through the issue of a FAI Declaration by LH.

In case of negative evaluation, corrective actions shall be put in place and a new FAIR *shall* be submitted to LH.

LH can accept some Serial Numbers delivered with a “FAI not complete”. In this case, the Supplier *will* receive a FAI Declaration with a limitation to those delivered serial numbers. The supplier *shall* have a system in place to monitor this status (to be considered as “FAI to be completed”), in order to ensure the performance of a delta-FAI to cover the non-conformances *will* be put in place from the following batch.

### 8.2.1 FAI Declaration for Manufacturers

If a FAI requesting LH evaluation is considered positive, a FAI Declaration is raised by the relevant LH Quality Control and sent to the Manufacturer.

The Manufacturer shall record and maintain all the FAI Declarations received.



First Article Inspection	QRS-101 Issue 04	Page 16/17
	June 2020	

### 8.2.2 FAI Declaration for Subcontractors

If a FAI is considered positive, a FAI Declaration is raised by Manufacturing Engineering, the FAI Declaration *will* be sent to the Subcontractor by the relevant Quality Control.

The Manufacturer shall record and maintain all the FAI Declarations received.

## 9 Documentation

### 9.1 Forms

Each field in the forms is designated with a unique reference number and is identified as follow:

- (R) – Required: Mandatory requirement
- (CR) – Conditionally required: *shall* be completed if applicable to the product (e.g. serial number *shall* be entered when there is a serial number) or upon LH request.
- (O) – Optional: this field is provided for convenience.

The forms *should* be used to document the results of first article inspection. All the forms can be completed either electronically or in permanent ink and *shall* be completed in English.

### 9.2 Characteristic Accountability

The supplier *shall* verify every design characteristic during the first article inspection and record the results. Every design characteristic *shall* have its own unique characteristic number.

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.

### 9.3 Record results

The supplier *shall* record the requirement and result in the units specified on the drawing, DPD or specification, unless otherwise approved by LH.

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 approved tooling is consistently used as a check feature and a go/no-go feature has been established for the specific characteristic. When approved tooling (e.g., radius gauges) are used as a go/no-go gauge, record the numerical minimum and maximum limits of the tooling.

First Article Inspection	QRS-101 Issue 04	Page 17/17
	June 2020	

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

#### 9.4 Control of records

FAI documentation required by this procedure *shall* be considered a quality record. The supplier *shall* retain the appropriate FAI documentation while the product is being produced and, at a minimum, retain them according to the relevant **QRS-01 Appendix 1 – Record Retention Table**.

#### 9.5 Delivery Documentation

Each Certificate of Conformity *shall* report FAI status of accomplishment (if “open”) and related FAI number (see note below).

In case of change of the status from “open” to “closed”, this information *shall* be reported at least for the first shipment of the articles with a “closed” FAI.

**When a FAI is requested, the minimum FAI documentation package to be provided is the FAI Plan, the FAIR and a FAI Declaration if issued, unless otherwise specified.**

In case of change of status from “closed” to “open” (if a re-accomplishment or delta FAI is requested), the first CoC of delivery *shall* clearly states the status of FAI (“open” or “closed”).

Note: The supplier *shall* report his own FAI identification number where an LH FAI number was not assigned through an LH Purchase Order or the FAI was not requested through Purchase Order.

#### 9.6 Right of Access

The supplier *shall* grant LH access to all documents related to FAI in case of LH Design Authority, upon request.

### 10 Appendices, Annexes and Forms

- QRS-101\_F01: Part Number Accountability form
- QRS-101\_F02: Article Accountability – Materials, special processes, and functional testing form
- QRS-101\_F03: Characteristic Accountability, Verification, and Compatibility Evaluation form