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Quality requirements for the supply of Raw Materials and Semi- Finished Products

SUMMARY:

This document describes the quality requirements and documentation required for the supply of raw materials and semi-finished products.

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to specify the specific quality requirements applicable to the supply of Raw Materials and Semi-Finished products to the Defence Systems Division of Leonardo S.p.A. (Leonardo-SDI) and in particular:

- ✓ the requirements to be met by the supplier when controlling the material supplied to Leonardo-SDI,
- ✓ The documentation required to provide evidence of the controls carried out on the material supplied.

More general quality requirements applicable to all supplies are defined in the PQA004-L procedure.

1.2 Applicability

This document applies to **Type F** supplies as identified in document PQA004-L, i.e. supplies of raw materials and semi-finished products to be incorporated in products for Leonardo-SDI customers or used to produce them.

1.3 Type and Classification Index of the supply

As provided for in document PQA004-L, each supply is characterised not only Type but also by a Classification Index, which identifies the characteristics of the supply and consequently the activities and documents required of the supplier.

*For example, code **F3** indicates a supply of Non-Ballistic Plates (Type F, Index 3).*

The possible values and meaning of the Classification Index for Type F (raw materials and semi-finished products) supplies are listed below. The relevant activities and documents required from the supplier are described in paragraphs 4 and 6.

Classification Index	Characteristics of the supply
1	Custom-made blanks (metal pieces) <i>(These comprise the raw materials required for producing barrels, gun tubes, breech blocks, bolts, jackets for gun tubes, sleeves for gun tubes, all of the raw materials required for producing underwater products, etc.).</i>
2	Ballistic Plates
3	Non-Ballistic Plates
4	Pressings and forgings <i>(excluding those used for Underwater products).</i>
5	Castings <i>(materials derived from casting, excluding those used for Underwater products)</i>
6	Other commercial raw materials <i>(bars, sections, sheets, extrusions, drawn rods, etc.)</i>

Table 1- Classification Index for Type F supplies

For each supply, the Type and Classification Index are indicated in the Purchase Order.

2 REFERENCES¹

2.1 Documents

Ref.	Code	Title
D1.	UNI EN 9100:2018	Quality Management Systems - Requirements for Aviation, Space and Defense Organizations.
D2.	UNI EN/AS 9102	Quality Systems - First Article Inspection
D3.	UNI EN 10204	Metallic products – Types of inspection documents
D4.	ISO 9001:2015	Quality Management System – Requirements
D5.	ISO 19011:2011	Guidelines for auditing management systems
D6.	ISO 10013:2001	Guidelines for Quality Management System Documentation.
D7.	EN 10204:2004	Metallic Products – Types of Inspection Documents
D8.	AQAP 2070	NATO Mutual Government Quality Assurance (GQA) Process
D9.	AQAP 2110 Ed D	NATO Quality Assurance Requirements for Design, Development and Production
D10.	STANAG 4107	Mutual Acceptance of Government Quality Assurance and Usage of the Allied Quality Assurance Publications (AQAP)
D11.	STANAG 4427	Introduction of Allied Configuration Management Publications (ACMP's)
D12.	S ST 0000-3169	Technical Specification barrel blanks for naval and artillery canons with a calibre of 60mm and above
D13.	S ST 0000-9212	Technical Specification breech block blanks for naval and artillery canons with a calibre of 60mm and above
D14.	OTO CO 163	Testing Procedure for barrel blanks
D15.	OTO CO 137	Testing Procedure for breech block blanks
D16.	OTO CO 139	Testing Procedure for bolt blanks
D17.	SCQ-228	Acceptance Specification for barrels, calibre 20mmdis. 812.10.1000 for 20mm automatic gun M61A1 and M197
D18.	MIL DTL 46027	Detail Specification - Armor Plate, Aluminum Alloy, Weldable 5083, 5456, & 5059
D19.	OTO-AB-01	Materials for the construction of armoured vehicles
D20.	TL 2350-0000	Technical conditions for supply of second-generation ballistic steel
D21.	NC78M001	Control Standard - Classification and Testing of Castings

¹ Standard and publications missing of date or revision index shall be considered at the latest released version.

Ref.	Code	Title
D22.	PQA004-L	Quality Requirements for Supplies to the Defence Systems Division of Leonardo S.p.A.
D23.	PQA008-L	Requirements for the supply of Special Processes
D24.	QUA017-T	List of approved suppliers of Special Processes/NDT and their sub-tier supply chain including internal processes

2.2 Template/Form/Checklist

Ref.	Code	Title
T1.	Form 1, EN9102	Part Number Accountability https://www.sae.org/aaqg/publications/as9102af1.doc
T2.	Form 2, EN9102	Product Accountability Raw Material, Specifications and Special Process(es), Functional Testing https://www.sae.org/aaqg/publications/as9102af2.doc
T3.	Form 3, EN9102	Characteristic Accountability, Verification and Compatibility Evaluation https://www.sae.org/aaqg/publications/as9102af3.doc

3 DEFINITIONS AND ACRONYMS

3.1 Definitions

For definitions see background document PQA004-L.

3.2 Acronyms

Acronym	Description
AC	Certified Chemical Analysis
ATP	Acceptance Test Procedure
NDT	Non-Destructive Tests
CoC	Certificate of Conformity
COTS	Commercial Off-The-Shelf
DT	Heat Treatment Diagram
EM	Certified Metallographic Examination
FAI	First Article Inspection
FAIR	First Article Inspection Report
GQAR	Government Quality Assurance Representative
HB	Brinell hardness
NC	Nonconformity
PO	Purchase Order
PB	Ballistic Tests
PBS	Product Breakdown Structure
MCP	Manufacturing and Control Plan
PR	Impact Test Certificate
PRR	Production Readiness Review
PT	Tensile Test Certificate

4 RELATIONS BETWEEN LEONARDO-SDI AND THE SUPPLIER

4.1 General requirements

The requirements defined in the following documents shall apply:

- PQA004-L (paragraph “*Supplier evaluation and monitoring*”);
- PQA004-L (paragraph “*Transmission of supply requirements*”);
- PQA004-L (paragraph “*Leonardo-SDI Interfaces with the Supplier*”).

4.2 Supplier Approval

Suppliers of raw materials and semi-finished products designed by Leonardo shall be verified and approved in advance by Leonardo-SDI through a validation process.

Validation is carried out by analysis of the company's quality system and verification of its production process.

The approved supplier is not allowed to produce all types of raw materials or semi-finished products but, where required by the applicable technical documentation, shall also submit for qualification the raw material Part Numbers that it intends to supply.

In this case, Leonardo-SDI will issue a qualification declaration after having carried out all tests necessary to verify the supplier; such qualification is only released for production of raw materials identified by the qualified Part Numbers.

Approval by Leonardo-SDI is required if the supplier has never worked with Leonardo-SDI or if more than two years have elapsed since the last supply.

4.2.1 Qualification of suppliers of custom-made blanks (Index 1)

Supplier qualification activities are performed in accordance with the following documentation:

- Barrel Blanks: the supplier shall apply the requirements contained in the applicable technical documentation and in documents S ST 0000-3169 and OTO CO 163.
- Breech Block Blanks: the supplier shall apply the requirements contained in the applicable technical documentation and in documents S ST 0000-9212 and OTO CO 137.
- Bolt Blanks: the supplier shall apply the requirements contained in the applicable technical documentation and in OTO CO 139.
- Jacket Blanks: the supplier shall apply the requirements contained in the applicable technical documentation.

Blanks for Torpedo Compartments and other Underwater products: the supplier shall apply the requirements contained in the applicable technical documentation and in document NC78M001.

The qualification activity for suppliers of custom-made blanks for torpedoes and other Underwater products has two distinct phases:

- 1) Verification of documents for release of provisional approval that allow the manufacturer of blanks to acquire purchase orders;
- 2) Production of a pilot batch for FAI (if required by the order).

Point 2 shall be performed for each type of blank (each P/N) for Underwater products that the supplier intends to produce.

If required by the applicable technical documentation, a sacrificial blank shall be produced for the qualification of Underwater products.

4.2.2 Qualification of suppliers of ballistic plates (Index 2)

In this case, the supplier shall select its sub-tiers from the manufacturer's authorized vendors, ensuring that the type of supplied product represents the vendor's core business.

The qualification requirements are specified in the applicable technical documentation of the specific product that the supplier intends to produce.

4.2.3 Qualification of suppliers of non-ballistic plates (Index 3)

In this case, the supplier shall select its sub-tiers from the manufacturer's authorized vendors, ensuring that the type of supplied product represents the vendor's core business.

The qualification requirements are specified in the applicable technical documentation of the specific product that the supplier intends to produce.

4.2.4 Qualification of suppliers of pressings and forgings (Index 4)

In this case, the supplier shall select its sub-tiers from the manufacturer's authorized vendors, ensuring that the type of supplied product represents the vendor's core business.

The qualification requirements are specified in the applicable technical documentation of the specific product that the supplier intends to produce.

4.2.5 Qualification of suppliers of castings (Index 5)

The qualification activity for suppliers of Steel castings or Light Alloy castings has two distinct phases:

- 1) Verification of documents for release of provisional approval that allow the manufacturer of castings to acquire purchase orders;
- 2) Production of a pilot batch for FAI.

Point 2 shall be performed for each type of raw forging (each P/N) that the supplier intends to produce.

If required by the applicable technical documentation, a sacrificial casting shall be produced for qualification.

4.2.6 Qualification of suppliers of other commercial raw materials (Index 6)

In this case, the supplier shall select its sub-tiers from the manufacturer's authorized vendors, ensuring that the type of supplied product represents the vendor's core business.

The qualification requirements are specified in the applicable technical documentation of the specific product that the supplier intends to produce.

5 SUPPLIER QUALITY SYSTEM

The requirements for the supplier's Quality System are defined in:

- PQA004-L (paragraph "*General requirements for the Supplier's Quality System*");
- PQA004-L (paragraph "*Documentation management*").

6 REQUIREMENTS FOR PRODUCT REALISATION

6.1 Management of supplies from sub-tiers

The requirements set out in the document PQA004-L (paragraph "*Management of Sub-tier supplies*") shall apply.

6.2 Control of production

The supplier shall carry out the production activities under controlled conditions. Those conditions shall include:

- a) Activity schedule (to be sent within 1 month of receipt of the purchase order and, in case of changes, 1 month before starting activities);
- b) Quality Plan if required by the Purchase Order, to be sent to Leonardo-SDI for approval within 1 month of receipt of the purchase order;
- c) Manufacturing and Control Plan - mandatory for materials with classification index 1, 2, 4 and 5 and in any case where required in the order (to be sent at least 1 month before starting activities for approval by Leonardo-SDI);
- d) Special Process Control Procedure - mandatory for materials with classification index 1, 2, 3, 4 and 5 and in any case where required in the order (to be sent at least 1 month before starting activities for approval by Leonardo-SDI). The supplier shall apply the requirements defined in PQA008-L.
- e) Testing Procedure with the Leonardo-SDI Customer - mandatory for materials with classification index 1, 2, 4 and 5 and in any case where required in the order (to be sent at least 1 month before the tests for approval by Leonardo-SDI);
- f) Packaging and Shipping Procedure - mandatory for materials with classification index 1, 2, 4 and 5 and in any case where required in the order (to be sent at least 1 month before the tests for approval by Leonardo-SDI);
- g) Availability of technical documents describing the characteristics of the product requested;
- h) Use of equipment suitable for production and availability of work instructions (if necessary);
- i) Monitoring and measurement of product conformity through the use of appropriate equipment, the suitability of which for use and periodic calibration shall always be ensured. The conformity of the product shall be documented.

The supplier shall check the supply materials in accordance with the requirements of the drawing and the applicable technical documentation, which may be referred to in the order.

If expressly indicated in the purchase order or required by the applicable technical documentation referred to in the order, the supplier shall carry out FAI on a product from the first production batch in accordance with the provisions of Appendix A, in accordance with UNI EN/AS 9102 (see also paragraph 4.2 and sub-paragraphs).

6.3 Supply documentation

All certification related to the supply shall comply with the traceability requirement.

If STANAG 4107 is mentioned in the PO, the supplier shall agree with Leonardo-SDI the procedures for conducting the activities. In this case, the documentation shall be received by Leonardo-SDI countersigned by Government Quality Assurance.

The following documents shall be provided by the supplier to support supplies of raw materials, in addition to those specified in paragraph 6.2.

6.3.1 Documentation for Blanks (Index 1)

For each batch of the supply, the certification required is indicated in the applicable technical documentation.

In the absence of specific information, the following documents shall be provided:

1. CoC (accompanied by any waiver/concession requests previously approved by Leonardo-SDI);
2. MCP, duly completed;
3. FAIR (if applicable);
4. Certificate of Chemical Analysis of the material with evidence of the casting;
5. HB Hardness Certificate;
6. Certificate of Mechanical Characteristics (e.g.: tensile, impact test certificates, etc.);
7. Certificate of Heat Treatment carried out with the relative temperature-time diagram;
8. Certificate of Metallographic examination (with verification of austenitic grain and micro inclusions);
9. Crack Detection Certificate (Magnetic Particle Inspection);
10. Ultrasound Control Certificate;
11. Dimensional Control Certificate;
12. X-ray examination certificate (only if required in the technical documentation);
13. Penetrating liquids test certificate (only if required in the technical documentation);
14. Electrical conductivity test certificate (only if required in the technical documentation);
15. For each supply batch, if requested in the Leonardo-SDI documentation, the supplier shall deliver a surplus of the supply batch that is representative and homogeneous in terms of chemical analysis and heat treatment for possible verification by Leonardo-SDI through laboratory tests.

6.3.2 Documentation for Ballistic Plates (Index 2)

For each batch of the supply, the certification required is indicated in the applicable technical documentation.

In the absence of specific information, the following documents shall be provided:

- 1 CoC (accompanied by any waiver/concession requests previously approved by Leonardo-SDI);
- 2 MCP, duly completed;
- 3 FAIR (if applicable);
- 4 Certificate of Chemical Analysis of the material with evidence of the casting and the plate;
- 5 HB Hardness Certificate;
- 6 Certificate of Mechanical Characteristics (e.g.: tensile, impact test certificates, etc.);
- 7 Metallographic Examination;
- 8 Ultrasound Control Certificate;
- 9 Dimensional Control Certificate;
- 10 Ballistic Tests Certificate.

Ballistic plates shall be identified by specifying the plate and casting according to the provisions of MIL DTL 46027, according to OTO-AB-01 or TL 2350-0000.

6.3.3 Documentation for Non-Ballistic Plates (Index 3)

For each supply batch, the supplier shall deliver:

- 1 CoC (accompanied by any waiver/concession requests previously approved by Leonardo-SDI);
- 2 Certificate of Chemical Analysis of the material with evidence of the casting;
- 3 HB Hardness Certificate;
- 4 Certificate of Mechanical Characteristics;
- 5 Ultrasound Control Certificate;
- 6 Dimensional Control Certificate.

6.3.4 Documentation for Pressings and Forgings (Index 4)

For each supply batch, the supplier shall deliver a surplus of the supply batch that is representative and homogeneous in terms of chemical analysis and heat treatment for the necessary verifications by Leonardo-SDI.

For each batch of the supply, the certification required is indicated in the applicable technical documentation; in the absence of specific information, the following documents shall be provided:

- 1 CoC (accompanied by any waiver requests previously approved by Leonardo-SDI);
- 2 MCP, duly completed;
- 3 Certificate of Chemical Analysis of the material with evidence of the casting;
- 4 HB Hardness Certificate;
- 5 Certificate of Mechanical Characteristics (e.g.: tensile, impact test certificates, etc.);
- 6 Certificate of Heat Treatment carried out with the relative temperature-time diagram;
- 7 Metallographic Examination;
- 8 Magnetic Crack Detection Certificate;
- 9 Dimensional Control Certificate.

6.3.5 Documentation for Castings (Index 5)

For each supply batch, the supplier shall deliver a surplus of the supply batch that is representative and homogeneous in terms of chemical analysis and heat treatment for the necessary verifications by Leonardo-SDI. The castings shall be permanently identified with the casting and serial number and all documentation shall ensure the traceability of the individual piece

For each batch of the supply, the certification required is indicated in the applicable technical documentation; in the absence of specific information, the following documents shall be provided:

- 1 CoC (accompanied by any waiver/concession requests previously approved by Leonardo-SDI);
- 2 MCP, duly completed;
- 3 Certificate of Chemical Analysis of the material with evidence of the casting;
- 4 Certificate of Mechanical Characteristics (e.g.: tensile, impact test certificates, etc.);
- 5 Dimensional Control Certificate;
- 6 X-ray examination certificate if required in the drawing.

For the acceptance criteria and methods for repairing defects, the supplier shall follow the instructions in the applicable technical documentation; if instructions are not specified, the supplier shall contact Leonardo-SDI to agree on the operating procedures.

6.3.6 Documentation for other commercial raw materials (Index 6)

This requirement applies to the supply of commercial raw materials (*bars, sections, sheets, extrusions, drawings, etc.*). For each supply batch, the supplier shall deliver:

- 1 CoC (accompanied by any waiver requests previously approved by Leonardo-SDI);
- 2 Certificate of Chemical Analysis of the material with evidence of the casting;
- 3 HB Hardness Certificate;
- 4 Certificate of Mechanical Characteristics;
- 5 Dimensional Control Certificate;
- 6 In the case of Dealers: Dealer's CoC with certification that the supply is under the manufacturer's certification

6.4 Identification and Traceability

The supplier shall ensure product traceability with appropriate identification methods according to the requirements of PQA004-L (paragraph "*Identification and traceability*").

The supplier shall implement a Configuration Management System that meets the requirements of AQAP 2110 (see also PQA004-L, paragraph "*Configuration Management System*").

6.5 Acceptance of the supply

The supplier shall invite in writing Leonardo-SDI to the acceptance tests, at least 15 working days before the scheduled date; within that period Leonardo-SDI will notify its intention to attend the tests or authorize the shipment on the basis of the documentation presented.

The invitation shall be sent to the relevant Leonardo-SDI site.

If provided for by the PO, the testing and acceptance activities shall be carried out in the presence of the GQAR.

6.5.1 Certificate of Conformity

The CoC shall comply with type 3.1 of UNI EN 10204 that is also applicable to non-metallic products. If the supply is subject to Government Quality Assurance, the CoC shall comply with AQAP 2070.

6.5.2 Prevention of Counterfeit Parts

The supplier shall certify the materials with suitable documentation to ensure the originality of the supply materials and the absence of counterfeiting.

6.6 Control of nonconforming products

The supplier shall promptly notify Leonardo-SDI of any nonconformities found during the production cycle and agree on their management, which may involve repairs, rejection or acceptance with a waiver.

The requirements set out in the document PQA004-L (paragraph "*Control of nonconforming products*") shall apply.

6.7 Product preservation

The requirements defined in the document PQA004-L shall apply (see paragraphs "*Storage and protection*" and "*Packaging and shipping*").

7 RIGHT OF ACCESS AND SUPPORT FOR THE CUSTOMER AND GQAR

The requirements defined in the document PQA004-L shall apply (paragraph "*Right of access and support for the Customer and GQAR*").

Appendix A. FIRST ARTICLE INSPECTION

A.1. INTRODUCTION

A.1.1. Purpose

The purpose of First Article Inspection (FAI) is:

1. To validate the Supplier's production processes, confirming on a piece from the first production batch that the manufacturing processes used are capable of producing products that comply with the applicable requirements and technical documentation
2. To verify that production processes are applied systematically and are therefore stable and repeatable.

The purpose of this appendix is to define:

- ✓ The requirements to be met by the supplier when checking the first part (hereinafter First Article Inspection) on products supplied to Leonardo-SDI,
- ✓ The documentation required to demonstrate the checks carried out on the cycle and the equipment used.

A.1.2. Applicability

This appendix applies to all supplies of raw materials and semi-finished products in which the execution of the FAI is expressly indicated in the purchase order.

A.2. Glossary

Definition	Description
Attribute	The result of the control of a characteristic or property that is evaluated only as to whether it conforms or not to the requirement but is not numerically quantified (e.g. pass-not pass or conforms-does not conform).
Balloon drawing	A drawing in which each characteristic or requirement is clearly marked with a unique identification number. The number can be within a circle or box for easy visual identification
Design Characteristic	<p>"Design Characteristics" are all of the dimensional, visual, functional (mechanical, electrical, embedded software, etc.) and property or performance characteristics of the materials constituting the object, as specified in the design documentation.</p> <p>"Design Characteristics" include process variables (e.g. heat treatment temperature and time), acceptability criteria (e.g. inspection class with penetrating liquids, acceptability standards), control procedures and welding sequences.</p>
Drawing Requirements	<p>These are the requirements indicated in the drawing, the bill of materials (if not mentioned in the drawing), the specifications or the purchase documents according to which the article is produced.</p> <p>They also include all notes, specifications and lower-level drawings.</p>
Evaluation	Measurement, inspection or test to determine conformity of a characteristic with the requirements of the design.
FAI	A complete, independent and documented physical and functional verification process to confirm that the production methods adopted have produced an acceptable item as specified in the drawings, purchase order, technical specifications and/or other applicable documents.
FAIR	FAIR is a set of documents and records, issued or drawn up for each individual part and/or assembly constituting the object of the FAI and organised according to a specific standard set out in standard UNI EN/ AS AS 9102.
First Production Run	<p>The first group of one or more parts which are the result of a defined production process which is to be used for the future production of the same part.</p> <p>Prototype parts or parts made using methods other than those envisaged by the production process shall not be considered as part of the First Production Run.</p>
Inaccessible Characteristic	<p>A characteristic that can only be assessed when it is generated without sacrificing the part.</p> <p>For example, inaccessible dimensions such as internal dimensions of castings or welded joints</p> <p>Or inaccessible non-dimensional characteristics such as chemical and physical properties</p>
FAI Planning	All of the activities that shall be carried out before production begins and that are included in a document called an FAI Plan
Fit, Form and Function (3F or FFF)	Often called 3F or FFF, these define the characteristics of a component. If the fit, form and function requirements are the same then the parts are interchangeable.

A.3. REQUIREMENTS

The forms to be used are those indicated in the UNI EN 9102 standard (see Appendix B, Appendix C and Appendix D) available on the SAE website; other forms may be used that contain the same fields as those provided for in the above standard, with the option of excluding those indicated as optional (O).

In case of conflict between UNI EN 9102 and this requirement document, the latter shall take precedence.

Requirement 1

The outcome of the FAI is binding for continuation of the standard production and shall be performed on a representative article from the first production batch. The Supplier shall not proceed with delivery before the FAI has been approved by Leonardo-SDI. The FAI requirement shall be extended to all sub-tiers.

Requirement 2

The Supplier shall send the FAI Plan to Leonardo-SDI within one month of receiving the order. The document shall contain the activities carried out by the sub-tiers.

The FAIs carried out by sub-tiers are an integral part of the FAI for the material covered by the PO and shall be sent with it.

Requirement 3

The FAIs carried out on the individual items (Detail FAI Form 1 field 13) constituting the material covered by the PO are an integral part of the FAI for the assembly (Assembly FAI Form 1 field 13).

Requirement 4

The Supplier shall inform Leonardo-SDI of the start of planned activities at least 15 working days before the activities are carried out.

Leonardo-SDI reserves the right to participate in any phase indicated in the FAI Plan.

In addition, the supplier shall notify Leonardo-SDI in writing of its intention to apply amendments to the FAI Plan at least 10 working days prior to their actual application.

Requirement 5

The Supplier shall carry out the FAI on the first production batch: any exceptions shall be authorized in writing by Leonardo-SDI.

Requirement 6

The Supplier shall carry out the FAI in whole or in part when:

- 1 Design changes are made that affect interchangeability (3F);
- 2 Modifications are made to the production process, control methods, production site, source materials and equipment that could affect interchangeability (3F);
- 3 Changes are made to numerical control programs or other programming languages that could affect interchangeability (3F);
- 4 Natural events or events caused by human factors occur that could affect the production process;
- 5 More than two years have passed since the last batch was produced or as otherwise specified by Leonardo-SDI.

Requirement 7

The FAI requirement can be satisfied by a partial FAI (Partial FAI - Form 1 field 14), instead of a total FAI (Full FAI - Form 1 field 14), relating only to the differences between the current configuration and a previously approved configuration, provided that all the other cases of the previous requirement are respected.

The FAI requirement can be fulfilled by a previously approved FAI carried out on identical characteristics of a similar product produced with the same equipment, the same production cycle, the same materials and at the same site.

Requirement 8

FAI does not apply to:

- 1 COTS materials;
- 2 "Deliverable" software;
- 3 Commercial metallic and non-metallic raw materials;
- 4 Prototypes;
- 5 Repaired materials.

Requirement 9

The FAI is not complete (Not Complete - Form 1 field 19) until all nonconformities on the item have been closed and until all the corrective actions necessary to eliminate the causes have been taken. Partial FAI (Partial FAI - Form 1 field 14) shall be repeated only on nonconforming characteristics.

Requirement 10

The Supplier shall complete the forms in Appendix B of the UNI EN 9102 standard, filling in all of the fields as indicated in the standard itself.

The FAI documentation shall include the records required for verifying that the product fully meets the requirements.

Requirement 11

The Supplier shall properly retain the FAI documentation for at least 15 years unless otherwise indicated in the PO and shall provide Leonardo-SDI with a copy of the FAI if requested, at no additional cost unless provided for in the PO.

Requirement 12

If the FAIR is incomplete, partially incorrect or not passed, Leonardo-SDI reserves the right to have the Supplier partially or completely repeat the FAI at no additional cost.

Requirement 13

The item which undergoes FAI shall be identified by marking according to the drawing (if the drawing does not provide for identification, a label shall be used to identify the item or to refer to its identification on its packaging).

A.4. KEY FEATURES OF THE FAI

A.4.1. Action plan for conducting the FAI

The Supplier shall carry out the FAI under its own responsibility, on one or more representative items (if agreed with Leonardo-SDI) from the first production batch.

The FAI action plan is all of the activities to be carried out before starting the production process of a supply subject to FAI. The plan shall provide for:

1. Verification that the applicable configuration referenced in the PO matches what has been received; Identification of all of the characteristics to be checked, as indicated in the applicable technical documentation. These characteristics shall be tracked during the FAI process and shall be identified in the drawings (e.g. Balloon Drawing), specifications and all applicable technical documentation and shall be copied down in Form 3 of the FAIR.
2. Identification of the key characteristics to ensure that these are properly verified during the production process;
3. Definition of the methods for validating the 3D measurement programs, with relevant evidence to be provided in support of the validation of the measurement program;
4. Review of the manufacturing plans, working instructions and applicable technical documentation to verify their clarity and detail and the definition of the control sampling methods;
5. Verification that the qualifications of the personnel assigned to the activities indicated in the production process are suitable for the operations and special and critical processes envisaged;
6. Verification that the sub-tiers providing parts of the supply are able to provide all the evidence in support of the FAI;
7. Verification that sub-tiers of special, critical and NDT processes are in document QUA017-T. Identification of the equipment to be used to support the production process and verification that the calibrations are still valid during the period of use, according to procedures of its Quality Management System;
8. Verification of the presence of the functional test procedure and sending it to Leonardo-SDI for approval;
9. Verification of the presence of the packaging and shipping procedure, according to the procedures provided for by the supplier's Quality Management System and sending it to Leonardo-SDI for approval;
10. Checking for the presence of any nonconformities recorded in the past (if any), making the appropriate corrections to the manufacturing process.

A.4.2. FAI PLAN

The supplier shall send the FAI Plan to Leonardo-SDI within one month of receipt of the PO, the schedule is essentially a table or a GANTT chart that shows:

1. The date of availability at the supplier's premises of the materials procured for carrying out the activities, appropriately identifying all the components of the supply;
2. The dates of the processes reported in the MCP with particular emphasis on those relating to special processes and all inspections (with identification of holding points and witness points). Remember that the FAI Plan and the MCP shall contain the sequences of controls necessary for performing the appropriate checks on the characteristics shown on the drawings by the "ballooning" method;
3. The delivery date of the MCP, ATP and FAIR;
4. The dates of the final tests.

On a monthly basis (to be agreed with the supplier), joint audits will be carried out with Leonardo-SDI and the supplier in order to verify the effective performance of the planned activities. In the event of significant deviations between the plan and progress, the frequency of the progress meetings shall be increased.

A.4.3. Preliminary activities for the FAI

The approval by Leonardo-SDI of the following documents is required prior to the conduct of FAI activities:

1. FAI Plan;
2. Test procedure (ATP);
3. Production control documents (e.g. MCP).

A.4.4. Conduct of the FAI

- 1 The FAI shall be performed on one or more items (if agreed with Leonardo-SDI) which are representative of the first production batch, known as the First Production Run;
- 2 The FAI shall be performed on all of the components which make up the assembly;
- 3 The FAI shall be performed and documented in accordance with UNI EN 9102 and this document;
- 4 Each FAI shall be accompanied by a FAIR, drawn up in accordance with the forms listed in the UNI EN 9102 standard;
- 5 The supporting evidence for all checks referred to in the FAIR shall be an integral part of the FAIR;
- 6 The FAI shall be performed after the Product Readiness Review (PRR) when requested in the order.

A.4.5. Status of the FAI

The FAI status is 'not complete' (FAI Not Complete - Form 1 field 19) when:

- 1 Nonconformities relating to the item are still open and any corrective action still needs to be taken,
- 2 The supplier shall only repeat the FAI for nonconforming characteristics.

A.4.6. Filling in the FAI forms

The forms shall be filled in according to these instructions and standard UNI EN 9102 either in Italian or English.

All fields of the forms have cells which are colour coded and a font-based code on the text:

Required (R)	"Yellow" background and bold font
Required, under certain conditions (CR)	"Blue" background and <i>bold italic</i> font
Optional (O)	"White" background 2 regular font

Form 1 - Part Number Accountability

Used to identify the item which is subject to FAI and related sub-assemblies, for details on how to complete this form, see Appendix B.

Form 2 - Product Accountability (Raw Material, Specifications and Special Process(s), Functional Testing)

Used to identify materials and/or special processes and/or functional tests that have been defined as "design requirements"; see Appendix C for details on how to complete this form.

Form 3 - Characteristic Accountability, Verification and Compatibility (Evaluation)

Shall be used to record the results of inspections carried out; see Appendix D for details on how to complete this form.

